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ABSTRACT

Since the fall of 1984, the Pennsylvania Department of Education has conducted a yearly statewide testing of the reading and mathematics competencies of students in grades 3, 5, and 8. Because Pennsylvania does not mandate statewide curricula, the Department has had to rely upon committees of state educators to determine which objectives to test. This study provides instructional validity information about the 1987 objectives in the two areas, determining whether what was tested was being taught to most students in the three grade levels. The differential item functioning (DIF) technique was used to compare the 1987 performance on an objective of students who were in buildings where it was taught with the performance on the objective of students in buildings where it was not taught. The teacher survey results support the instructional validity of the objectives, although several mathematics objectives were identified for closer examination. The administrator survey did not provide instructional validity information, but produced somewhat limited curricular validity information. The DIF technique functioned well in examining achievement differences of Taught and Untaught groups and appears to be an effective way of picturing patterns of difference for various skills. Twenty tables and 12 graphs are provided. Appendices summarize the objectives and include the sample objectives rating survey. (SLD)

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A STUDY OF DIFFERENCES BETWEEN WHAT IS TAUGHT AND WHAT IS TESTED IN PENNSYLVANIA

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James R. Masters

Pennsylvania Department of Education

Presented at the Annual Meeting of the
National Council on Measurement in Education

New Orleans, Louisiana
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ABSTRACT

Since the fall of 1984, the Pennsylvania Department of Education has conducted a yearly statewide testing of the reading and mathematics competencies of students in grades 3, 5 and 8. Because Pennsylvania does not mandate statewide curricula, the Department has had to rely upon committees of state educators to determine which objectives to test. The study which was performed provided instructional validity information about the 1987 objectives in the two areas, determining whether what was tested was being taught to most students in the three grade levels. The differential item functioning (DIF) technique was utilized in the study to compare the 1987 performance on an objective of students who were in buildings where it was taught with the performance on the objective of students in buildings where it was not taught. The teacher survey results which were gathered supported the instructional validity of the objectives, although a number of mathematics objectives were identified for closer examination. The administrator survey which was conducted did not appear to provide instructional validity information, but rather produced somewhat limited curricular validity information. The DIF technique functioned well in examining achievement differences of Taught and Untaught groups and appears to be an effective way of picturing patterns of difference for skills of various types.

INTRODUCTION

In the fall of 1984 the Pennsylvania Department of Education began testing students in grades 3, 5 and 8 as the first implementation of its Testing for Essential Learning and Literacy Skills (TELLS) statewide testing program. This program was conceived as a means of identifying students who were in need of help in reading or mathematics and who were still at an early stage of their school careers. The third testing was carried out in March of 1987 and the fourth testing was recently completed, in March of 1988. Both the testing program and district remedial efforts are now routinely being conducted. The tests are now referred to in Pennslyvania as the Tests of Essential Learning Skills; the acronym TELLS is no longer used.

One major difficulty faced by the testing program since its inception has been that Pennsylvania does not mandate a statewide curriculum in either reading or mathematics. The question of which objectives to test at each of the three grade levels has required a great deal of thought and discussion. Committees of Pennsylvania educators were consulted to develop both the original list of objectives for the fall 1984 testing and the subsequent list, for use in the last three years when testing took place in the spring rather than the fall. The objectives developed for spring testing are shown in Appendix A.

Throughout the four years of the existence of the program, educators from across the state have examined the objectives and, in some cases, have commented negatively about the match between these and their district's curriculum. Others have indicated that they have had to alter their curriculum in order to teach certain objectives by the state testing time.

Comments such as those just described led to the present study. It was recognized that there was a need to conduct a validation study of the objectives in order to determine the extent to which they did in fact match the curricula of the majority of the districts of the state. There was no intent in the creation of the TELLS program either to force districts to adopt a statewide curriculum or to place students into remedial programs in large part because they had never been taught the

material being tested. The study to be described in this paper was conducted in late winter and early spring of 1987. It involved a statewide survey to examine objectives and district curricula, and, further, an investigation of the extent to which failure by some schools to teach particular objectives led to lower student performance on these in the March 1987 testing.

REVIEW OF RELATED RESEARCH

In 1979 a major court case in Florida caused educators who were involved in conducting competency testing programs to begin examining much more closely the match between what they were testing and what was being taught in schools. In this case, referred to as Debra P. v. Turlington (1979), the plaintiffs were high school students who were to be denied high school diplomas because they had failed to pass the state's minimum competency examination. The decision of the court broadened the definition of content validity of a test by now ruling that students' rights were being violated if they were denied diplomas because of being tested on material they had not been taught in school. This was termed "curricular validity" by the court but was, as pointed out by Popham and Lindheim (1981), actually "instructional validity". The term "curricular validity" is accepted by the measurement community to refer to the judgment of whether the material in question is in the written curriculum of those being tested. If it is in the written curriculum but has not been taught by the time of a student's testing, it would be ruled that the test evidenced curricular validity but not instructional validity.

Popham and Lindheim (1981) called for states involved in mimimum competency testing efforts to begin gathering evidence of the instructional validity of their tests. At a minimum they should be able to show that the content being assessed appears in course syllabi, but much more importantly, there should be evidence that "classroom transactions" address the specific objectives. To gather such transaction information they suggested using elaborate methods, such as electronic recordings, or less elaborate ones, such as pupil and teacher reports of what was taught in classrooms.

The gathering of instructional validity information is not an easy task. As Calfee (1983) pointed out, the Debra P. case also raised issues which go beyond whether or not a particular skill is taught. One can also raise such questions as: "How much time was spent teaching it"? "How well was it taught"? "How recently was it taught"? With respect to the recency question, Madaus (1983) argued that if basic skills taught at that grade level are tested then, the test is an achievement test. "But, if in the eleventh grade the test measures basic skills taught in the sixth grade the test may be in fact an aptitude test" (p. 45).

A relatively large number of investigators have studied the degree to which tests and curriculum materials match. Floden, et al. (1978) compared the content of five major standardized achievement tests with a content map of topics typically covered by teachers in elementary mathematics. They found major differences across tests, especially for areas other than addition, subtraction and division. Freeman, et al. (1980) used a three-dimensional taxonomy to classify all of the student exercise items in three widely used fourth grade mathematics textbooks and all fourth grade mathematics items in four commonly used standardized achievement tests. They found only a limited number of topics consistently emphasized in these. They concluded that even the best matched textbooks and tests did not provide a consistent description of the fourth grade mathematics curriculum. Mehrens and Phillips (1987) compared the degree to which three textbook series covered the mathematics content of the level of the Stanford Achievement Test administered to grade 6 students (Intermediate 2). They found some differences in content coverage using a 180-cell matrix classification but these differences were not especially great, particularly when they took into consideration the textbooks in both grades 5 and 6. Jenkins and Pany (1976) compared the relative overlap in the contents of five standardized reading achievement tests with the contents of seven commercial reading series at the first and second grade levels. On the basis of this analysis they projected that there definitely would be expected differences in achievement scores both across the tests for a single curriculum and on a single test for different reading curricula.

Freeman, et al. (1983) studied instructional validity from the standpoint of how teachers use textbooks. They compared the instructional validity of standardized tests for teachers categorized into five different styles of textbook use. These styles ranged from teachers who worked straight

through the textbook from the beginning until the the end of the year, to those who selectively omitted topics, to those involved in a management by objectives system, focusing only upon specific minimal competencies. Teachers in the study used the same fourth grade mathematics textbook and five standardized tests were utilized. The results indicated that textbook style was highly related to instructional validity, with the management by objectives teachers doing least well in terms of the match between what was taught and what was tested by the five achievement tests.

The relationship between students' performance on a test and the degree to which the test matches what they were taught has also been addressed by a number of investigators. Walker and Schaffarzick (1974) reviewed studies which addressed achievement differences between students who were in classes which used innovative curricula and those who were not. They concluded that their investigation had revealed not that the new curricula were uniformly superior to the old ones, but rather that "different curricula are associated with different patterns of achievement" (p. 97). Students in the studies examined were typically found to achieve better than fellow students on tests which included items not covered at all in the other curriculum or at least given less emphasis.

Leinhardt and Seewald (1981) described "overlap" as "the extent to which there is a match between the content of what is taught and the content of the test used to measure progress in performance" (p. 85). They utilized curriculum-based and instructional-based measures of overlap in their evaluation work and concluded that these contributed significantly to the prediction of posttest scores of students involved in their studies.

Mehrens and Phillips (1987), in the second portion of the investigation described above, studied whether item p-values of standardized achievement tests appeared to be related to measures of curricular validity. They found that the differences which did exist across the three textbook series in their coverage of the content of the Stanford Achievement Test had no observable relationship to item p-value differences. Their overall conclusion was that the naturally occurring curricular differences within a school district are not large enough to produce observable differences on standardized tests.

Mehrens and Phillips (1986) studied differences in standardized test scores resulting from curricular differences across the buildings of two school systems. In their investigation, district personnel rated the degree of curriculum-test match for reading and mathematics in grades 3 and 6. In addition, the effects of using different textbook series were determined. Their analyses indicated that neither the curriculum match nor the textbook series used had a significant impact on student test scores.

Lewy (1972) investigated student achievement in arithmetic, geography and literature at the fourth grade level in Israel. Teachers of the three subject areas were asked to mark the test items their students did not have an opportunity to study. He found significant correlations between the number of tested topics which had been studied and student achievement. These results were much stronger for arithmetic than for literature, with the geography results of intermediate strength. He explained the results as a function of a number of factors including more transfer occurring in literature than in the specific arithmetic skills; more ability of students to learn skills outside of school for literature and geography; more reliable teacher ratings of what they had taught in arithmetic, since these skills are more easily separated; and more variance in skills covered versus not covered in arithmetic than in the other two areas, thus providing more opportunity to find differences in achievement which were a function of these.

Because of such investigations and what is generally known about how student learning takes place, differential achievement results for specific groups may often be a function of their different instructional backgrounds. As one such example, Linn and Harnish (1981) used a three-parameter latent trait approach in locating grade 8 mathematics items which appeared to reflect "bias" against either blacks or whites. They interpreted these differences as possibly the result of "instructional bias", i.e., they believed they could be reflective of the fact that the amount of instruction in the areas of difference was not the same for black and white students.

To document achievement differences and then accurately attribute them to differences in instruction is a complex task. Indications of student success in achieving an objective may, for example, not truly reflect instructional success. As Venezky (1983) stated: "High student scores on

a test objective do not constitute proof, however, of a valid curriculum, nor do low scores necessarily constitute proof of invalidity. Not all learning takes place in the classroom. Students might consolidate or even acquire some competency objectives from home or community experience - perhaps in spite of ineffective school instruction" (p. 184).

The safest approach to take in studying such highly complex relationships may be to work at the most specific level possible. After reviewing the research that has been done in this area, Airasian and Madaus (1983) stated that the post hoc analyses of Linn and Harnish (1981), of Miller and Burstein (1980), of Miller (1980) and of Hanson and Bailey (1982), "have demonstrated that test-instruction linkage must focus on the individual item or objective rather than on the total test score" (p. 111).

Thus, quite a number of investigations focusing upon problems similar to the one addressed in the present study have taken place. Few, however, have been as large in scope as the present investigation.

INSTRUMENTATION

To adequately conduct the needed study in Pennsylvania, six questionnaires were required, one for each subject area/grade level combination. A preliminary version of each was developed and administered in the spring of 1986 to 159 teachers who had been asked by the Department of Education to assist in writing reading and mathematics items for the testing program.

These teachers were not only asked to provide information about the degree to which their curricula matched the objectives but also to rate the importance of each objective, to suggest needed revisions in the objectives and to write down new objectives which they believed should be added to the present lists.

The results of this tryout indicated that the questionnaire approach functioned adequately. Teachers found little difficulty in reporting both matches and mismatches with their districts' curricula.

On the basis of this tryout, the final forms of the six measures were developed. Not only were revisions made in the scale, but also the proposed revisions and additions of objectives of these groups were added to those already listed from other sources and these were included as possibilities for rating by survey respondents.

As shown in the sample in Appendix B, the final forms of the six questionnaires contained three sections. In the first section, the present objectives were listed and respondents were asked about each: "Is this objective taught to most of your students by the TELLS testing date, i.e., early March?". If their answer was "Yes", they were asked to rate its importance using a scale based upon one developed by Ebel (1972, p. 492). The categories of the scale were: "Essential", "Important", "Adequate", "Questionable", and "Delete". The second section of each questionnaire focused upon revisions in the present objectives which had been proposed by the teacher tryout groups and others. Respondents were asked whether they agreed with each change and, for comparative purposes, were again given the same rating scale to rate the importance of each. The final section addressed new objectives suggested by the teacher groups and by others. Respondents were asked to indicate whether they agreed with each addition and to rate the importance of the proposed new objectives. Throughout the questionnaires spaces were provided for comment and both Section Two and Section Three included space for respondents to write revised or proposed new objectives.

Because of the great amount of data gathered through the questionnaires, it was possible in this paper only to deal with the results relating directly to the question of whether or not objectives were taught by the testing date. The importance rating results are contained in Kohr, et al. (1987) and the very specific information gathered on revisions and additions of objectives is being used internally to closely examine the objectives lists.

DATA SOURCE

The Department of Education had previously asked each district to appoint a person to coordinate the administration of the state testing program in his or her district. This person was sent the questionnaires for distribution in his or her district.

Because it was assumed that there could be as much diversity across buildings of the same district as across school districts, at least one reading and one mathematics questionnaire were sent for every building housing students of the grade level addressed. Additional questionnaires were sent for larger buildings at the rate of one reading and one mathematics questionnaire for each 100 students being served at the grade level addressed.

Teachers of grades 3, 5 and 8 were to complete these survey instruments. Districts were instructed to have the surveys completed either by individual teachers chosen as typical of those in their buildings in terms of the curricula being taught or by groups of teachers working in collaboration.

A second set of questionnaires was sent to the testing coordinator for completion by someone at the district level. One of each of the six questionnaires was to be completed by persons knowledgeable about the overall curriculum of the district.

In February of 1987, a total of 14,566 surveys were sent out. Since there are 500 districts which operate programs in the state, a total of 3,000 of the surveys were intended for administrators and the balance for teachers.

Returns were received from 453 districts, a district return rate of approximately 91 percent. The percentages of districts sending back at least one questionnaire ranged from 89.2 percent for grade 5 reading to 83 percent for grade 8 reading.

Because some districts chose to send back fewer surveys than were sent to them or, in some cases, not to send back surveys for all three levels, a lesser response rate was achieved for individuals. A total of 10,468 surveys were returned (72 percent). The 8,661 teacher surveys which were received constituted a return rate of 74.9 percent; the administrator return rate was lower, 60.2 percent, with a total of 1,807 questionnaires returned.

The sampling approach which was taken was intended to weight large buildings more than small buildings in summarizing the results for teachers. Because more surveys were sent to large buildings than small, it would be expected that more would be received from them. This was not necessarily the case, however, since in some of the larger buildings teachers sent in one completed questionnaire in reading and one in mathematics to serve as the entire building's response.

To take such sampling problems into account, completed teacher surveys were coded by building and matched with information on the number of students of the appropriate grade level in that building. It was then possible to compute statistics on return rates by building, to determine percentages of students represented by the teacher respondents and to compare student achievement on an objective for those students who had been taught it with those who had not been.

Surveys were sent to 1,958 buildings housing grade 3 students, to 1,810 buildings housing grade 5 students and to 739 buildings housing grade 8 students. This represents all public schools in the state housing at least some students of these grade levels who are not special education students. Returns were received as follows: grade 3 reading - 1,467 buildings (74.9 percent); grade 3 math - 1,517 buildings (77.5 percent); grade 5 reading - 1,374 buildings (75.9 percent); grade 5 math - 1,396 buildings (77.1 percent); grade 8 reading - 525 buildings (71.0 percent); and grade 8 math - 558 buildings (75.5 percent). The numbers of non-special education students tested in these buildings were 105,642 at the grade 3 level, 100,825 at the grade 5 level and 110,377 at the grade 8 level, although all of these students did not take both the reading and the math test. The percentages of students represented by the teachers who responded to the survey ranged from 73.4 percent for grade 3 reading to 78.9 percent for grade 8 math.

RESULTS

Investigation of the Degree to Which Objectives Were Taught by Teachers

Teacher results focusing upon whether each of the objectives was taught by the testing date are summarized by building in Tables 1 through 6. In the "percentages of buildings" columns, all buildings are weighted equally, regardless of size. In the "percentages of students in buildings" columns the student enrollments in the grade level become a weighting factor, taking into account the sizes of each building.

In the tables, the four groupings of percentages of teachers (i.e., "Between 0% and 24.9%", "Between 25% and 49.9%", etc.) were chosen as a means of fitting a great deal of data into the same table. Because the number of teachers who responded from a particular building was generally less than four, it was relatively rare to compute a percentage which was either between 0.1% and 24.9% or between 75% and 99.9%. Rather, almost all of the buildings included in the lowest grouping had no teachers who had taught the objective; similarly, almost all of the buildings included in the highest grouping had all teachers teaching the objective.

The results for grade 3 and grade 5 reading in Tables 1 and 2 provide strong evidence of the instructional validity of the objectives. As shown in Table 1, all 14 of the grade 3 reading objectives were taught by at least three-fourths of the teachers in at least 93.8 percent of the buildings. The lowest percentage of students who were taught in such a building was 92.9 percent for objective number 6, Stated Cause and Effect. As summarized in Table 2, all but three of the grade 5 reading objectives were taught by the testing date by the great majority of teachers in at least 90 percent of the buildings. The other three objectives were taught routinely in at least 79 percent of the buildings responding.

The grade 8 reading results summarized in Table 3 appear to be less supportive of instructional validity but must be interpreted with caution. First of all, it can be said that the great majority of the teachers in at least 70 percent of the buildings responding reported teaching 19 of the 25

Table 1
Grade 3 Reading
Percentages of Buildings Whose Teachers Had Taught Objectives
By the Testing Date and Percentages of Students Represented

	Between 0% and 24.9% of Teachers Taught Objective			Between 25% and 49.9% of Teachers Taught Objective			Between 50% and 74.9% of Teachers Taught Objective			Between 75% and 100% of Teachers Taught Objective		
Objective	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.
1	46	3.2	3.3	0	0.0	0.0	13	0.9	1.6	1387	95.9	95.1
2	25	1.7	1.9	0	0.0	0.0	7	0.5	0.9	1416	97.8	97.2
3	20	1.4	1.5	0	0.0	0.0	3	0.2	0.4	1424	98.4	98.2
4	14	1.0	0.9	0	0.0	0.0	2	0.1	0.2	1433	98.9	98.8
5	18	1.2	1.2	0	0.0	0.0	2	0.1	0.2	1427	98.6	98.6
6	80	5.5	5.9	1	0.1	0.1	9	0.6	1.1	1355	93.8	92.9
7	10	0.7	0.6	0	0.0	0.0	0	0.0	0.0	1438	99.3	99.4
8	5	0.3	0.4	0	0.0	0.0	1	0.1	0.1	1442	99.6	99.6
9	64	4.4	3.9	0	0.0	0.0	16	1.1	2.0	1367	94.5	94.0
10	55	3.8	3.9	0	0.0	0.0	8	0.6	0.9	1384	95.6	95.2
11	69	4.8	4.3	0	0.0	0.0	15	1.0	1.7	1363	94.2	94.0
12	44	3.0	3.1	0	0.0	0.0	8	0.6	1.0	1393	96.4	95.9
13	23	1.6	1.6	0	0.0	0.0	3	0.2	0.4	1421	98.2	98.1
14	30	2.1	2.1	0	0.0	0.0	6	0.4	0.8	1411	97.5	97.1

Table 2
Grade 5 Reading
Percentages of Buildings Whose Teachers Had Taught Objectives
By the Testing Date and Percentages of Students Represented

	Between 0% and 24.9% of Teachers Taught Objective			Between 25% and 49.9% of Teachers Taught Objective			Between 50% and 74.9% of Teachers Taught Objective			Between 75% and 100% of Teachers Taught Objective		
Objective	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.
1	8	0.6	0.4	0	0.0	0.0	4	0.3	0.5	1344	99.1	99.0
2	9	0.7	0.7	0	0.0	0.0	4	0.3	0.7	1343	99.0	98.6
3	101	7.5	6.4	0	0.0	0.0	25	1.9	3.7	1225	90.7	89.9
4	8	0.6	0.6	0	0.0	0.0	6	0.4	1.0	1341	99.0	98.4
5	13	1.0	1.2	0	0.0	0.0	4	0.3	0.6	1340	98.7	98.2
6	45	3.3	3.6	0	0.0	0.0	13	1.0	2.1	1296	95.7	94.3
7	21	1.5	1.5	0	0.0	0.0	12	0.9	1.8	1322	97.6	96.6
8	59	4.4	3.5	0	0.0	0.0	14	1.0	2.0	1276	94.6	94.5
9	85	6.3	6.5	0	0.0	0.0	21	1.6	2.8	1245	92.2	90.7
10	25	1.8	1.9	1	0.1	0.3	9	0.7	1.4	1318	97.4	96.4
11	70	5.2	5.7	0	0.0	0.0	18	1.3	3.1	1260	93.5	91.2
12	163	12.1	12.8	1	0.1	0.1	34	2.5	5.7	1149	85.3	81.3
13	87	6.4	5.9	2	0.1	0.6	23	1.7	3.5	1240	91.7	90.0
14	12	0.9	0.9	0	0.0	0.0	2	0.1	0.3	1340	99.0	98.9
15	149	11.0	11.1	1	0.1	0.2	33	2.4	5.1	1168	86.5	83.6
16	75	5.6	5.5	1	0.1	0.2	15	1.1	2.2	1257	93.2	92.2
17	225	16.7	16.8	0	0.0	0.0	54	4.0	8.2	1068	79.3	75.0
18	89	6.6	5.4	0	0.0	0.0	21	1.6	2.8	1238	91.8	91.8

Table 3
Grade 8 Reading
Percentages of Buildings Whose Teachers Had Taught Objectives
By the Testing Date and Percentages of Students Represented

	Between 0% and 24.9% of Teachers Taught Objective			Between 25% and 49.9% of Teachers Taught Objective			Between 50% and 74.9% of Teachers Taught Objective			Between 75% and 100% of Teachers Taught Objective		
Objective	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.
1	2	0.4	0.2	0	0.0	0.0	12	2.3	2.9	508	97.3	96.9
2	8	1.5	1.0	0	0.0	0.0	14	2.7	3.5	500	95.8	95.5
3	2	0.4	0.3	1	0.2	0.3	17	3.3	4.3	501	96.2	95.2
4	4	0.8	0.6	3	0.6	0.7	25	4.8	5.8	489	93.9	92.9
5	5	1.0	0.8	0	0.0	0.0	7	1.3	1.5	510	97.7	97.7
6	26	5.0	4.2	2	0.4	0.4	38	7.3	8.8	456	87.4	86.6
7	11	2.1	1.9	0	0.0	0.0	20	3.8	4.9	491	94.1	93.2
8	3	0.6	0.6	0	0.0	0.0	6	1.1	1.5	513	98.3	98.0
9	21	4.0	3.3	2	0.4	0.3	24	4.6	5.1	475	91.0	91.3
10	23	4.4	3.8	2	0.4	0.4	44	8.4	9.7	452	86.8	86.1
11	22	4.2	4.2	0	0.0	0.0	41	7.9	8.6	459	87.9	87.1
12	24	4.6	4.0	0	0.0	0.0	34	6.5	7.1	464	88.9	88.9
13	58	11.2	9.6	5	1.0	1.0	77	14.8	17.9	380	73.1	71.6
14	18	3.5	3.3	3	0.6	0.7	30	5.8	6.2	470	90.2	89.8
15	49	9.4	8.5	7	1.3	1.5	71	13.6	17.1	395	75.7	72.9
16	77	14.8	12.8	16	3.1	3.9	94	18.0	20.9	335	64.2	62.4
17	77	14.8	13.9	9	1.7	2.7	85	16.3	19.8	349	67.1	63.6
18	26	5.0	5.4	2	0.4	0.4	49	9.4	11.9	445	85.2	82.3
19	12	2.3	1.8	3	0.6	0.7	21	4.0	4.5	484	93.1	93.0
20	95	18.2	16.7	14	2.7	4.1	105	20.2	23.9	307	58.9	55.2
21	39	7.5	5.6	8	1.5	2.5	57	10.9	13.3	418	80.1	78.5
22	60	11.5	9.9	9	1.7	2.6	75	14.4	16.3	378	72.4	71.3
23	92	17.6	15.3	20	3.8	5.4	91	17.4	19.7	319	61.1	59.7
24	129	24.7	21.8	21	4.0	5.5	96	18.4	22.4	276	52.9	50.4
25	190	36.6	32.1	29	5.6	8.3	111	21.4	24.5	189	36.4	35.1

Table 4
Grade 3 Mathematics
Percentages of Buildings Whose Teachers Had Taught Objectives
By the Testing Date and Percentages of Students Represented

	Between 0% and 24.9% of Teachers Taught Objective			Between 25% and 49.9% of Teachers Taught Objective			Between 50% and 74.9% of Teachers Taught Objective			Between 75% and 100% of Teachers Taught Objective		
Objective	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.
1	33	2.2	2.2	0	0.0	0.0	13	0.9	1.5	1455	96.9	96.3
2	18	1.2	1.3	0	0.0	0.0	6	0.4	0.7	1475	98.4	98.0
3	44	2.9	3.3	0	0.0	0.0	10	0.7	1.0	1446	96.4	95.7
4	39	2.6	2.3	0	0.0	0.0	13	0.9	1.7	1447	96.5	96.0
5	13	0.9	1.1	0	0.0	0.0	4	0.3	0.3	1482	98.9	98.5
6	27	1.8	2.2	0	0.0	0.0	10	0.7	1.0	1462	97.5	96.8
7	146	9.8	9.7	1	0.1	0.2	14	0.9	1.7	1335	89.2	88.4
8	840	56.4	54.6	4	0.3	0.7	50	3.4	6.2	596	40.0	38.5
9	672	45.0	44.7	3	0.2	0.4	34	2.3	4.1	785	52.5	50.8
10	74	5.0	5.1	1	0.1	0.1	7	0.5	0.9	1408	94.5	93.9
11	7	0.5	0.4	0	0.0	0.0	4	0.3	0.4	1487	99.3	99.1
12	28	1.9	1.7	0	0.0	0.0	4	0.3	0.6	1465	97.9	97.6
13	889	59.7	57.8	6	0.4	0.8	40	2.7	4.4	555	37.2	37.0
14	84	5.6	5.6	0	0.0	0.0	13	0.9	1.6	1401	93.5	92.8
15	147	9.8	9.7	0	0.0	0.0	20	1.3	2.1	1332	88.9	88.1
16	470	31.5	31.5	2	0.1	0.4	29	1.9	3.1	993	66.5	65.0
17	143	9.6	9.6	1	0.1	0.2	20	1.3	2.5	1330	89.0	87.8
18	105	7.1	7.2	0	0.0	0.0	15	1.0	2.0	1369	91.9	90.9
19	78	5.2	5.2	0	0.0	0.0	14	0.9	1.6	1406	93.9	93.2
20	208	13.9	13.9	0	0.0	0.0	24	1.6	2.6	1265	84.5	83.5
21	369	24.6	23.7	1	0.1	0.1	39	2.6	4.4	1089	72.7	71.8
22	576	38.7	37.8	0	0.0	0.0	39	2.6	4.4	874	58.7	57.8
23	226	15.2	15.6	2	0.1	0.3	29	1.9	3.2	1232	82.7	81.0

Table 5
Grade 5 Mathematics
Percentages of Buildings Whose Teachers Had Taught Objectives
By the Testing Date and Percentages of Students Represented

Objective	Between 0% and 24.9% of Teachers Taught Objective			Between 25% and 49.9% of Teachers Taught Objective			Between 50% and 74.9% of Teachers Taught Objective			Between 75% and 100% of Teachers Taught Objective		
	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.
1	3	0.2	0.2	0	0.0	0.0	1	0.1	0.1	1376	99.7	99.7
2	1	0.1	0.1	0	0.0	0.0	0	0.0	0.0	1379	99.9	99.9
3	2	0.1	0.1	0	0.0	0.0	1	0.1	0.1	1377	99.8	99.8
4	24	1.7	1.4	0	0.0	0.0	8	0.6	0.9	1342	97.7	97.6
5	5	0.4	0.3	0	0.0	0.0	2	0.1	0.1	1373	99.5	99.6
6	11	0.8	0.6	0	0.0	0.0	4	0.3	0.7	1365	98.9	98.7
7	96	7.0	6.2	1	0.1	0.2	19	1.4	2.8	1261	91.6	90.8
8	4	0.3	0.2	0	0.0	0.0	1	0.1	0.1	1374	99.6	99.7
9	21	1.5	1.3	0	0.0	0.0	7	0.5	1.2	1350	98.0	97.4
10	21	1.5	1.3	0	0.0	0.0	3	0.2	0.3	1354	98.3	98.4
11	687	50.2	49.0	6	0.4	1.2	48	3.5	6.6	628	45.9	43.2
12	499	36.4	34.9	2	0.1	0.4	39	2.8	6.2	829	60.6	58.5
13	590	43.2	42.8	4	0.3	0.8	47	3.4	7.2	725	53.1	49.1
14	492	35.9	35.7	3	0.2	0.8	44	3.2	6.4	831	60.7	57.0
15	328	24.0	23.4	2	0.1	0.5	37	2.7	5.5	1001	73.2	70.6
16	543	39.5	37.4	5	0.4	1.1	32	2.3	4.5	794	57.8	57.1
17	706	51.8	51.9	11	0.8	1.9	56	4.1	7.3	591	43.3	38.8
18	774	56.5	54.9	10	0.7	2.1	47	3.4	6.6	539	39.3	36.4
19	30	2.2	2.4	0	0.0	0.0	9	0.7	1.5	1334	97.2	96.1
20	91	6.6	6.4	0	0.0	0.0	27	2.0	4.5	1259	91.4	89.0
21	26	1.9	1.6	0	0.0	0.0	12	0.9	2.1	1337	97.2	96.3
22	189	13.7	13.0	4	0.3	0.7	39	2.8	5.2	1144	83.1	81.1
23	433	31.5	32.1	10	0.7	1.8	49	3.6	6.9	883	64.2	59.1
24	879	64.5	63.4	10	0.7	1.8	44	3.2	5.8	430	31.5	29.1
25	839	61.5	60.4	8	0.6	1.5	42	3.1	5.7	476	34.9	32.5

Table 6
Grade 8 Mathematics
Percentages of Buildings Whose Teachers Had Taught Objectives
By the Testing Date and Percentages of Students Represented

	Between 0% and 24.9% of Teachers Taught Objective			Between 25% and 49.9% of Teachers Taught Objective			Between 50% and 74.9% of Teachers Taught Objective			Between 75% and 100% of Teachers Taught Objective		
Objective	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.	Number of Bldgs.	% of Bldgs.	% of Stud. in Bldgs.
1	2	0.4	0.2	2	0.4	0.6	9	1.6	1.8	542	97.7	97.4
2	0	0.0	0.0	2	0.4	0.6	5	0.9	1.3	549	98.7	98.2
3	3	0.5	0.5	1	0.2	0.3	13	2.3	3.1	538	96.9	96.2
4	4	0.7	0.5	2	0.4	0.6	11	2.0	2.2	538	96.9	96.6
5	5	0.9	1.0	1	0.2	0.1	11	2.0	2.2	538	96.9	96.6
6	4	0.7	0.6	1	0.2	0.3	15	2.7	3.4	535	96.4	95.7
7	4	0.7	0.5	3	0.5	0.8	13	2.3	2.9	535	96.4	95.9
8	3	0.5	0.4	1	0.2	0.1	9	1.6	2.1	542	97.7	97.4
9	1	0.2	0.2	0	0.0	0.0	5	0.9	1.5	550	98.9	98.3
10	1	0.2	0.2	0	0.0	0.0	7	1.3	2.0	548	98.6	97.8
11	1	0.2	0.2	1	0.2	0.4	10	1.8	2.3	544	97.8	97.1
12	2	0.4	0.3	1	0.2	0.4	10	1.8	2.2	543	97.7	97.2
13	7	1.3	0.7	2	0.4	0.4	29	5.2	6.3	518	93.2	92.6
14	186	33.6	32.8	36	6.5	9.5	97	17.5	20.2	235	42.4	37.5
15	194	35.0	34.0	37	6.7	9.9	101	18.2	20.7	222	40.1	35.3
16	164	29.7	27.2	41	7.4	11.4	121	21.9	25.0	227	41.0	36.4
17	132	23.8	21.6	33	6.0	8.9	100	18.1	21.3	289	52.2	48.2
18	245	44.4	43.8	35	6.3	9.6	97	17.6	19.9	175	31.7	26.7
19	16	2.9	1.9	4	0.7	1.1	42	7.6	8.9	494	88.8	88.1
20	29	5.2	3.8	7	1.3	2.2	46	8.3	10.1	474	85.3	83.8
21	5	0.9	0.4	7	1.3	2.0	35	6.3	7.5	508	91.5	90.1
22	280	50.5	48.7	52	9.4	13.9	91	16.4	17.6	131	23.6	19.7
23	217	39.2	38.6	46	8.3	12.1	103	18.6	21.1	188	33.9	28.2
24	172	31.1	29.8	32	5.8	8.6	100	18.1	21.3	249	45.0	40.4
25	172	31.1	29.9	29	5.2	7.7	99	17.9	21.2	253	45.8	41.2
26	168	30.5	28.6	33	6.0	8.7	106	19.3	22.4	243	44.2	40.2
27	147	26.6	23.6	24	4.3	6.8	108	19.6	23.5	273	49.5	46.2
28	75	13.5	12.4	18	3.2	5.7	88	15.9	18.8	373	67.3	63.1
29	83	15.0	12.4	18	3.2	4.5	100	18.0	21.8	354	63.8	61.4
30	109	19.7	16.9	29	5.3	7.0	109	19.7	23.8	305	55.3	52.3
31	86	15.6	13.0	25	4.5	6.3	109	19.7	24.0	332	60.1	56.7
32	25	4.5	3.9	9	1.6	2.8	42	7.6	8.8	479	86.3	84.5
33	10	1.8	1.3	3	0.5	1.0	21	3.8	4.5	521	93.9	93.2
34	22	4.0	2.6	4	0.7	0.8	46	8.3	10.2	483	87.0	86.3

objectives. The percentages of buildings in which the remaining 6 objectives were reported to be routinely taught ranged from 67.1 for objective 17 to 36.4 for objective 25. Examination of the content of these objectives indicates that they are in the areas of Inferential Comprehension and Life/Study and Reference skills. The Inferential Comprehension objectives in the group of six evidently were not taught as routinely at the grade 8 level as were other objectives in the list, but such reading skills have almost certainly been addressed at lower levels. Many of the Life/Study and Reference skills are also taught at lower grade levels but are also as likely to be taught in other subject areas as in reading. Teacher comments, written to explain their ratings, indicated that some of these could be taught in social studies and some in library science.

The mathematics results summarized in Tables 4 through 6 provide evidence which seems to indicate that there are certain objectives of the lists which should be examined closely. However, there is also evidence in the tables, in the teacher comments written to explain their ratings and in the student performance results shown beside each objective in Appendix A which point to an overall judgment that the great majority of the mathematics objectives have been taught prior to their testing date. At the grade 3 level, (Table 4), 18 of the 23 objectives were found to have been routinely taught in at least 70 percent of the buildings. At the grade 5 level, 15 of the 25 objectives were taught routinely in at least 70 percent of the buildings. And at the grade 8 level, 19 of the 34 objectives were routinely taught in at least 70 percent of the buildings and an additional six were taught by over one-half of the teachers in at least 70 percent of the buildings.

The mathematics results at grades 3 and 5 were examined objective by objective in an effort to explain them. Interpretation of these results was guided by the many teacher comments written in the spaces provided to indicate reasons for the responses given. Teachers were encouraged especially to write such comments when they reported that they had not taught an objective by the testing data.

At the grade 3 level, then, number 8 (Multiplication/No Renaming) and number 9 (Division/Basic Facts) are truly objectives which some students were taught by the testing date and others were not. Objective 13 (Fractional Regions) and objective 22 (Plane Figures) have typically been

taught in grade 2 and also learned in everyday life. Objective 16 (Length/Cm or Inches) has the distinction of reflecting this country's ambivalence about the metric system. Although most students had been exposed to measurement of objects with a ruler by the time of the third grade testing, some had been taught using inches and some using metric measures. Many teachers who completed the survey wrote that they had not marked the objective as having been taught because they had introduced only one of the measurement systems.

At the grade 5 level, some teachers simply had not reached the Fractions objectives, numbers 11 through 15, by the testing date. The most basic of these, number 15 (Fractional Regions), had certainly been learned at earlier levels and outside of school, but the more complex ones may not have. The Decimals objective, number 16, was generally covered at earlier levels, but specifically as it applied to calculations involving money. The metrics versus customary system controversy was documented again in the results for objective 17, (Conversions/Customary/Metric), with some teachers having focused their efforts upon one system or the other. Objective 18, addressing finding the perimeter or area of a polygon, would have been reported as having been taught by a much greater percentage of teachers if its statement related only to finding perimeters. This is all that was tested in 1987, since students had evidenced so much difficulty with area problems in field tests. The final three objectives, dealing with circle or line graphs, solid figures and plane figures had generally been learned at earlier levels or outside of school.

A more general statement can be made about the grade 8 mathematics results shown in Table 6. Overall, one can say that the objectives of the list reflect much content which has been covered at earlier grade levels. Some teachers may not have taught all of these objectives at the grade 8 level by the testing time, but such coverage would have been in the nature of a review for the great majority of students. As examples of this, objectives 22 and 23 would be judged from the results of Table 6 to be among the least often taught of those in the list. These objectives deal with circle graphs, bar graphs and line graphs. Circle and line graphs are also addressed in a grade 5 objective, so there is little reason to believe these had not truly been covered by grade 8.

Administrator Ratings and District-Level Summary of the Degree to Which Objectives Were Taught

The teacher rating task just described was a straightforward investigation of instructional validity. Curriculum specialists and administrators asked to respond to the survey were to report similar information, this time with the expectation that they would take into account what was taught in their classrooms at other grade levels. They were asked exactly the same question about each objective as were teachers, i.e., "Is this objective taught to most of your students by the TELLS testing date, i.e., early March"? They were not asked to describe the curriculum on paper but rather to provide information about what was actually being taught.

Tables 7 through 12 were constructed specifically to examine exactly what the administrator component of the study was contributing. These tables reflect comparisons between administrator and teacher responses for those districts in which both teachers and administrators responded.

A cursory scanning of the tables provides assurance that the administrators were taking a broader viewpoint than were teachers with respect to the teaching of objectives. Especially for grade 8 reading and for the three mathematics levels, fairly sizable percentages of figures appeared for certain objectives in the columns labeled "Administrators Said Was Taught But Majority of Teachers Did Not". These types of ratings would be indications that an objective was not being taught at the specific grade level of the teachers surveyed but was being taught at earlier levels.

However, there is also evidence in these tables that administrators were providing ratings which were more a function of the curriculum on paper than in practice. For example, for objectives 8 and 9 of grade 3 mathematics and for the Fractions objectives of grade 5 mathematics many administrators disagreed with their teachers' ratings that the objectives had not been taught by the testing date. Since these objectives are known not to be typically covered at earlier levels than those at which they are listed, it must be the case that some administrators had expected teachers to reach objectives which they did not reach in 1987 with their students. In other words, it appears

Table 7
Grade 3 Reading
Comparison Between Districts' Teacher and
Administrator Responses to the Question Addressing
Whether Objectives Were Taught by the Testing Date

	Admins. and Majority of Teachers Said Was Not Taught		Admins. and Majority of Teachers Said Was Taught		Admins. Said Was Taught But Majority of Teachers Did Not		Majority of Teachers Said Was Taught But Admins. Did Not	
Obj.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.
1	2	0.7	278	94.2	7	2.4	8	2.7
2	3	1.0	284	95.9	3	1.0	6	2.0
3	3	1.0	284	95.9	3	1.0	6	2.0
4	0	0.0	291	98.3	1	0.3	4	1.4
5	1	0.3	294	99.3	1	0.3	0	0.0
6	5	1.7	264	89.2	7	2.4	20	6.8
7	0	0.0	296	100.0	0	0.0	0	0.0
8	0	0.0	295	99.7	0	0.0	1	0.3
9	3	1.0	276	93.9	6	2.0	9	3.1
10	1	0.3	279	94.3	8	2.7	8	2.7
11	5	1.7	258	87.8	9	3.1	22	7.5
12	3	1.0	277	93.9	8	2.7	7	2.4
13	2	0.7	279	94.9	5	1.7	8	2.7
14	1	0.3	276	93.6	2	0.7	16	5.4

Table 8
Grade 5 Reading
Comparison Between Districts' Teacher and
Administrator Responses to the Question Addressing
Whether Objectives Were Taught by the Testing Date

	Admins. and Majority of Teachers Said Was Not Taught		Admins. and Majority of Teachers Said Was Taught		Admins. Said Was Taught But Majority of Teachers Did Not		Majority of Teachers Said Was Taught But Admins. Did Not	
Obj.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.
1	0	0.0	294	98.0	2	0.7	4	1.3
2	2	0.7	297	98.7	1	0.3	1	0.3
3	8	2.7	270	90.3	14	4.7	7	2.3
4	0	0.0	297	98.7	3	1.0	1	0.3
5	0	0.0	296	98.3	2	0.7	3	1.0
6	5	1.7	285	95.0	5	1.7	5	1.7
7	0	0.0	297	98.7	3	1.0	1	0.3
8	1	0.3	287	95.7	6	2.0	6	2.0
9	8	2.7	269	90.0	16	5.4	6	2.0
10	3	1.0	286	95.3	7	2.3	4	1.3
11	7	2.3	270	90.3	17	5.7	5	1.7
12	23	7.7	234	78.5	22	7.4	19	6.4
13	10	3.4	264	88.6	14	4.7	10	3.4
14	1	0.3	295	99.0	0	0.0	2	0.7
15	22	7.4	227	76.2	27	9.1	22	7.4
16	4	1.3	266	89.0	16	5.4	13	4.3
17	27	9.0	214	71.6	32	10.7	26	8.7
18	4	1.3	272	91.3	15	5.0	7	2.3

Table 9

Grade 8 Reading
Comparison Between Districts' Teacher and
Administrator Responses to the Question Addressing
Whether Objectives Were Taught by the Testing Date

Obj.	Admins. and Majority of Teachers Said Was Not Taught		Admins. and Majority of Teachers Said Was Taught		Admins. Said Was Taught But Majority of Teachers Did Not		Majority of Teachers Said Was Taught But Admins. Did Not	
	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.
1	1	0.4	234	97.1	3	1.2	3	1.2
2	4	1.7	233	96.7	2	0.8	2	0.8
3	1	0.4	237	98.3	3	1.2	0	0.0
4	0	0.0	233	96.7	7	2.9	1	0.4
5	0	0.0	239	99.2	2	0.8	0	0.0
6	6	2.5	218	90.5	13	5.4	4	1.7
7	2	0.8	234	97.1	3	1.2	2	0.8
8	0	0.0	240	99.6	0	0.0	1	0.4
9	2	0.8	225	93.8	8	3.3	5	2.1
10	1	0.4	218	90.5	15	6.2	7	2.9
11	5	2.1	218	90.5	12	5.0	6	2.5
12	4	1.7	222	92.1	9	3.7	6	2.5
13	17	7.1	192	79.7	25	10.4	7	2.9
14	2	0.8	225	93.4	13	5.4	1	0.4
15	18	7.5	193	80.8	18	7.5	10	4.2
16	27	11.3	164	68.6	33	13.8	15	6.3
17	18	7.5	173	72.1	35	14.6	14	5.8
18	4	1.7	215	89.2	14	5.8	8	3.3
19	3	1.3	225	94.9	4	1.7	5	2.1
20	25	10.4	156	65.0	48	20.0	11	4.6
21	10	4.2	199	82.9	24	10.0	7	2.9
22	8	3.3	185	77.1	38	15.8	9	3.7
23	17	7.1	162	67.8	47	19.7	13	5.4
24	43	18.0	125	52.3	55	23.0	16	6.7
25	65	27.7	84	35.7	71	30.2	15	6.4

Table 10
Grade 3 Mathematics
Comparison Between Districts' Teacher and
Administrator Responses to the Question Addressing
Whether Objectives Were Taught by the Testing Date

Obj.	Admins. and Majority of Teachers Said Was Not Taught		Admins. and Majority of Teachers Said Was Taught		Admins. Said Was Taught But Majority of Teachers Did Not		Majority of Teachers Said Was Taught But Admins. Did Not	
	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.
1	2	0.7	293	97.7	3	1.0	2	0.7
2	1	0.3	295	98.7	1	0.3	2	0.7
3	1	0.3	289	96.3	1	0.3	9	3.0
4	3	1.0	290	96.7	4	1.3	3	1.0
5	0	0.0	298	99.3	0	0.0	2	0.7
6	1	0.3	288	96.0	1	0.3	10	3.3
7	14	4.7	254	84.4	12	4.0	21	7.0
8	107	35.5	76	25.2	104	34.6	14	4.7
9	97	32.2	103	34.2	71	23.6	30	10.0
10	7	2.3	272	91.0	7	2.3	13	4.3
11	1	0.3	294	98.7	0	0.0	3	1.0
12	2	0.7	286	95.7	1	0.3	10	3.3
13	110	36.7	69	23.0	114	38.0	7	2.3
14	7	2.3	279	92.7	10	3.3	5	1.7
15	8	2.7	264	88.3	21	7.0	6	2.0
16	54	18.1	156	52.2	72	24.1	17	5.7
17	9	3.0	255	85.0	22	7.3	14	4.7
18	10	3.3	263	88.0	16	5.4	10	3.3
19	4	1.3	267	89.3	7	2.3	21	7.0
20	20	6.7	225	75.5	25	8.4	28	9.4
21	39	13.1	171	57.4	47	15.8	41	13.8
22	63	20.9	139	46.2	83	27.6	16	5.3
23	21	7.0	216	72.0	33	11.0	30	10.0

Table 11
Grade 5 Mathematics
Comparison Between Districts' Teacher and
Administrator Responses to the Question Addressing
Whether Objectives Were Taught by the Testing Date

Obj.	Admins. and Majority of Teachers Said Was Not Taught		Admins. and Majority of Teachers Said Was Taught		Admins. Said Was Taught But Majority of Teachers Did Not		Majority of Teachers Said Was Taught But Admins. Did Not	
	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.
1	0	0.0	301	100.0	0	0.0	0	0.0
2	0	0.0	301	100.0	0	0.0	0	0.0
3	0	0.0	300	99.7	0	0.0	1	0.3
4	0	0.0	292	97.0	5	1.7	4	1.3
5	0	0.0	298	99.0	1	0.3	2	0.7
6	0	0.0	296	98.3	3	1.0	2	0.7
7	2	0.7	270	90.0	12	4.0	16	5.3
8	0	0.0	300	99.7	0	0.0	1	0.3
9	0	0.0	293	97.7	2	0.7	5	1.7
10	2	0.7	293	97.3	0	0.0	6	2.0
11	100	33.2	97	32.2	95	31.6	9	3.0
12	60	20.1	160	53.7	63	21.1	15	5.0
13	80	26.8	121	40.5	84	28.1	14	4.7
14	65	21.8	160	53.7	65	21.8	8	2.7
15	36	12.1	197	66.1	44	14.8	21	7.0
16	77	25.6	134	44.5	79	26.2	11	3.7
17	120	39.7	79	26.2	84	27.8	19	6.3
18	135	44.9	63	20.9	82	27.2	21	7.0
19	1	0.3	287	96.0	8	2.7	3	1.0
20	7	2.3	259	86.3	21	7.0	13	4.3
21	0	0.0	289	97.0	7	2.3	2	0.7
22	13	4.4	233	78.2	31	10.4	21	7.0
23	63	20.8	145	47.9	66	21.8	29	9.6
24	133	44.3	56	18.7	102	34.0	9	3.0
25	126	42.0	65	21.7	92	30.7	17	5.7

Table 12
Grade 8 Mathematics
Comparison Between Districts' Teacher and
Administrator Responses to the Question Addressing
Whether Objectives Were Taught by the Testing Date

Obj.	Admins. and Majority of Teachers Said Was Not Taught		Admins. and Majority of Teachers Said Was Taught		Admins. Said Was Taught But Majority of Teachers Did Not		Majority of Teachers Said Was Taught But Admins. Did Not	
	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.	No. of Dist.	% of Dist.
1	1	0.4	257	98.8	2	0.8	0	0.0
2	0	0.0	258	99.2	1	0.4	1	0.4
3	3	1.2	256	98.5	1	0.4	0	0.0
4	2	0.8	256	98.5	2	0.8	0	0.0
5	2	0.8	247	95.7	4	1.6	5	1.9
6	2	0.8	254	98.1	2	0.8	1	0.4
7	2	0.8	256	98.5	2	0.8	0	0.0
8	2	0.8	255	98.5	1	0.4	1	0.4
9	0	0.0	260	100.0	0	0.0	0	0.0
10	0	0.0	257	98.8	0	0.0	3	1.2
11	1	0.4	258	99.2	1	0.4	0	0.0
12	0	0.0	255	98.5	1	0.4	3	1.2
13	4	1.5	237	91.2	12	4.6	7	2.7
14	70	26.8	109	41.8	76	29.1	6	2.3
15	74	28.4	108	41.4	72	27.6	7	2.7
16	57	21.9	124	47.7	77	29.6	2	0.8
17	58	22.6	134	52.1	54	21.0	11	4.3
18	99	38.2	74	28.6	74	28.6	12	4.6
19	5	1.9	244	93.8	9	3.5	2	0.8
20	9	3.5	226	86.9	13	5.0	12	4.6
21	0	0.0	250	96.2	6	2.3	4	1.5
22	96	36.8	60	23.0	97	37.2	8	3.1
23	74	28.6	83	32.0	91	35.1	11	4.2
24	66	25.4	118	45.4	65	25.0	11	4.2
25	62	23.9	121	46.7	66	25.5	10	3.9
26	63	24.9	114	45.1	63	24.9	13	5.1
27	83	32.7	108	42.5	32	12.6	31	12.2
28	39	15.2	151	59.0	31	12.1	35	13.7
29	36	14.1	169	66.3	34	13.3	16	6.3
30	48	18.9	146	57.5	52	20.5	8	3.1
31	40	15.7	158	62.2	47	18.5	9	3.5
32	9	3.5	231	90.6	12	4.7	3	1.2
33	3	1.2	246	96.5	3	1.2	3	1.2
34	12	4.7	218	85.5	11	4.3	14	5.5

true that at least some of the administrators who responded were providing curricular validity rather than instructional validity information.

Although the administrator ratings must be viewed with some skepticism as instructional validity ratings, they provide at least a broader basis for examining the objectives than teacher ratings of their ability to teach each objective during the specific year of its testing. Tables 13 through 18 were therefore constructed as a means of combining the teacher and administrator ratings.

To prepare these tables, three groups of districts were first identified with respect to their type of response to the survey: those for which only administrators responded, those for which only teachers responded and those for which both teachers and administrators responded. Decision rules then were developed in order to conclude whether a district would be counted as one which taught the objective by the testing date. These arbitrary rules are described at the bottom of the tables. The general rule used was that of counting a district as having taught an objective if either the administrator indicated that this was the case or the great majority of its students were in buildings in which all or almost all teachers taught the objective.

The district-level results are summarized in Tables 13 through 18. As can be seen, objectives which were among the lowest in terms of the percentages of teachers who reported teaching them were still among the lowest, but now the percentages for these were higher than were those reported in Tables 1 through 6. Almost all objectives in Tables 13 through 18 achieved the status of having been taught by the testing date in at least one-half of the districts responding and the great majority were taught in at least two-thirds. Most of those which did not achieve high percentages were in the grade 8 mathematics area. Some of these were definitely taught at earlier levels and were not reported by administrators to have been taught. An example of such an objective is number 22, dealing with circle graphs. A similar objective was reported to have been taught by the fifth grade level in approximately two-thirds of the buildings responding (Table 5, objective 23). Although this was the case, the results in Table 18 indicate that only 43.9 percent of the districts reported teaching such graphs by the eighth grade level.

Table 13

Grade 3 Reading
District-Level Results for Ratings of Whether
Objectives Were Taught by the Testing Date*

Obj.	Total No. of Districts Responding	Districts With Only Teacher Respondents			Districts With Only Administrator Respondents			Districts With Both Teacher and Administrator Respondents			Total No. of Dist. Reporting Obj. Was Taught	
		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught			
			No.	%		No.	%		No.	%	No.	%
1	437	138	130	94.2	5	5	100.0	294	292	99.3	427	97.7
2	437	137	131	95.6	5	5	100.0	295	291	98.6	427	97.7
3	437	137	132	96.4	5	5	100.0	295	292	99.0	429	98.2
4	437	137	134	97.8	5	5	100.0	295	295	100.0	434	99.3
5	437	137	134	97.8	5	4	80.0	295	294	99.7	432	98.9
6	437	137	125	91.2	5	5	100.0	295	287	97.3	417	95.4
7	437	137	136	99.3	5	5	100.0	295	295	100.0	436	99.8
8	437	137	137	100.0	5	5	100.0	295	285	100.0	437	100.0
9	437	139	124	89.2	5	4	80.0	293	289	98.6	417	95.4
10	437	137	129	94.2	5	4	80.0	295	294	99.7	427	97.7
11	437	139	124	89.2	5	5	100.0	296	293	97.6	415	95.0
12	437	138	131	94.9	5	5	100.0	294	290	98.6	426	97.5
13	437	139	138	99.3	5	5	100.0	293	291	99.3	434	99.3
14	437	138	133	96.4	5	5	100.0	294	292	99.3	430	98.4

* For districts with only teacher respondents, an objective was counted as one which was taught by the district if at least three-fourths of its students were in buildings where at least 75 percent of the teacher respondents had taught it. For districts with only administrator respondents, an objective was counted as one which was taught if the administrator indicated that it was taught at some time in the district's curriculum prior to the testing. In the few cases in which two administrators responded from the same district, both had to agree that an objective was taught for it to be counted as one which was taught prior to the testing. For districts with both teacher and administrator respondents, an objective was counted as one which was taught by the testing date if either the administrator indicated this or at least three-fourths of its students were in buildings where at least 75 percent of the teacher respondents had taught it.

Table 14

Grade 5 Reading
District-Level Results for Ratings of Whether Objectives Were Taught by the Testing Date*

Obj.	Total No. of Districts Responding	Districts With Only Teacher Respondents			Districts With Only Administrator Respondents			Districts With Both Teacher and Administrator Respondents			Total No. of Dist. Reporting Obj. Was Taught	
		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught			
			No.	%		No.	%		No.	%	No.	%
1	446	140	139	99.3	7	7	100.0	299	299	100.0	445	99.8
2	446	138	136	98.6	8	8	100.0	300	298	99.3	442	99.1
3	446	139	124	89.2	9	9	100.0	298	288	96.6	421	94.4
4	446	138	135	97.8	8	8	100.0	300	300	100.0	443	99.3
5	446	138	134	97.1	8	8	100.0	300	299	99.7	441	98.9
6	446	139	126	90.6	8	8	100.0	299	292	97.7	426	95.5
7	446	138	128	92.8	8	8	100.0	300	300	100.0	436	97.8
8	446	139	128	92.1	8	7	87.5	299	297	99.3	432	96.9
9	446	139	124	89.2	9	9	100.0	298	289	97.0	422	94.6
10	446	139	134	96.4	8	8	100.0	299	296	99.0	438	98.2
11	446	140	126	90.0	8	7	87.5	298	290	97.3	423	94.8
12	446	140	112	80.0	9	9	100.0	297	269	90.6	390	87.4
13	446	141	125	88.7	8	8	100.0	297	284	95.6	417	93.5
14	446	141	135	95.7	8	8	100.0	297	296	99.7	439	98.4
15	446	141	111	78.7	8	7	87.5	297	272	91.6	390	87.4
16	446	141	122	86.5	7	7	100.0	298	293	98.3	422	94.6
17	446	140	90	64.3	8	7	87.5	298	265	88.9	362	81.2
18	446	140	122	87.1	9	9	100.0	297	291	98.0	422	94.6

* For districts with only teacher respondents, an objective was counted as one which was taught by the district if at least three-fourths of its students were in buildings where at least 75 percent of the teacher respondents had taught it. For districts with only administrator respondents, an objective was counted as one which was taught if the administrator indicated that it was taught at some time in the district's curriculum prior to the testing. In the few cases in which two administrators responded from the same district, both had to agree that an objective was taught for it to be counted as one which was taught prior to the testing. For districts with both teacher and administrator respondents, an objective was counted as one which was taught by the testing date if either the administrator indicated this or at least three-fourths of its students were in buildings where at least 75 percent of the teacher respondents had taught it.

Table 15
Grade 8 Reading
District-Level Results for Ratings of Whether Objectives Were Taught by the Testing Date*

Obj.	Total No. of Districts Responding	Districts With Only Teacher Respondents			Districts With Only Administrator Respondents			Districts With Both Teacher and Administrator Respondents			Total No. of Dist. Reporting Obj. Was Taught	
		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught			
			No.	%		No.	%		No.	%	No.	%
1	415	155	150	96.8	20	19	95.0	240	239	99.6	408	98.3
2	415	155	149	96.1	20	20	100.0	240	236	98.3	405	97.6
3	415	155	148	95.5	20	20	100.0	240	239	99.6	407	98.1
4	415	155	143	92.3	20	20	100.0	240	240	100.0	403	97.1
5	415	155	151	97.4	20	20	100.0	240	240	100.0	411	99.0
6	415	155	130	83.9	20	19	95.0	240	233	97.1	382	92.0
7	415	155	140	90.3	20	20	100.0	240	238	99.2	398	95.9
8	415	155	150	96.8	20	20	100.0	240	240	100.0	410	98.8
9	415	156	138	88.5	20	19	95.0	239	236	98.7	393	94.7
10	415	155	123	79.4	20	20	100.0	240	237	98.7	380	91.6
11	415	155	131	84.5	20	19	95.0	240	234	97.5	384	92.5
12	415	155	130	83.9	20	19	95.0	240	236	98.3	385	92.8
13	415	155	99	63.9	20	19	95.0	240	223	92.9	341	82.2
14	415	155	137	88.4	20	18	90.0	240	238	99.2	393	94.7
15	415	157	108	68.8	20	17	85.0	238	218	91.6	343	82.7
16	415	157	92	58.6	20	18	90.0	238	207	87.0	317	76.4
17	415	154	86	55.8	22	20	90.9	239	217	90.8	323	77.8
18	415	155	123	79.4	20	19	95.0	240	233	97.1	375	90.4
19	415	157	143	91.1	22	22	100.0	236	233	98.7	398	95.9
20	415	156	79	50.6	20	19	95.0	239	210	87.9	308	74.2
21	415	156	117	75.0	20	18	90.0	239	229	95.8	364	87.7
22	415	156	103	66.0	20	18	90.0	239	228	95.4	349	84.1
23	415	157	80	51.0	20	17	85.0	238	218	91.6	315	75.9
24	415	157	72	45.9	20	13	65.0	238	190	79.8	275	66.3
25	415	160	47	29.4	20	10	50.0	235	166	70.6	223	53.7

* For districts with only teacher respondents, an objective was counted as one which was taught by the district if at least three-fourths of its students were in buildings where at least 75 percent of the teacher respondents had taught it. For districts with only administrator respondents, an objective was counted as one which was taught if the administrator indicated that it was taught at some time in the district's curriculum prior to the testing. For districts with both teacher and administrator respondents, an objective was counted as one which was taught by the testing date if either the administrator indicated this or at least three-fourths of its students were in buildings where at least 75 percent of the teacher respondents had taught it.

Table 16
Grade 3 Mathematics
District-Level Results for Ratings of Whether Objectives Were Taught by the Testing Date*

Obj.	Total No. of Districts Responding	Districts With Only Teacher Respondents			Districts With Only Administrator Respondents			Districts With Both Teacher and Administrator Respondents			Total No. of Dist. Reporting Obj. Was Taught	
		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught			
			No.	%		No.	%		No.	%	No.	%
1	442	138	133	96.4	5	5	100.0	299	296	99.0	434	98.2
2	442	139	138	99.3	5	5	100.0	298	297	99.7	440	99.5
3	442	138	133	96.4	5	5	100.0	299	297	99.3	435	98.4
4	442	138	132	95.7	5	5	100.0	299	295	98.7	432	97.7
5	442	138	137	99.3	5	5	100.0	299	299	100.0	441	99.8
6	442	138	136	98.6	5	5	100.0	299	296	99.0	437	98.9
7	442	136	106	77.9	6	6	100.0	300	279	93.0	391	88.5
8	442	137	22	16.1	5	3	60.0	300	188	62.7	213	48.2
9	442	137	42	30.7	5	4	80.0	300	189	63.0	235	53.2
10	442	139	123	88.5	5	5	100.0	298	290	97.3	418	94.6
11	442	140	140	100.0	5	5	100.0	297	296	99.7	441	99.8
12	442	138	136	98.6	6	6	100.0	298	295	99.0	437	98.9
13	442	137	21	15.3	6	4	66.7	299	187	62.5	212	48.0
14	442	137	122	89.1	5	5	100.0	300	293	97.7	420	95.0
15	442	139	116	83.5	5	5	100.0	298	287	96.3	408	92.3
16	442	138	68	49.3	6	6	100.0	298	237	79.5	311	70.4
17	442	138	109	79.0	5	5	100.0	299	288	96.3	402	91.0
18	442	138	125	90.6	6	6	100.0	298	286	96.0	417	94.3
19	442	139	129	92.8	5	5	100.0	298	291	97.7	425	96.2
20	442	140	102	72.9	5	5	100.0	297	269	90.6	376	85.1
21	442	140	79	56.4	6	5	83.3	296	245	82.8	329	74.4
22	442	137	60	43.8	6	6	100.0	299	227	75.9	293	66.3
23	442	138	97	70.3	5	4	80.0	299	268	89.6	369	83.5

* For districts with only teacher respondents, an objective was counted as one which was taught by the district if at least three-fourths of its students were in buildings where at least 75 percent of the teacher respondents had taught it. For districts with only administrator respondents, an objective was counted as one which was taught if the administrator indicated that it was taught at some time in the district's curriculum prior to the testing. In the few cases in which two administrators responded from the same district, both had to agree that an objective was taught for it to be counted as one which was taught prior to the testing. For districts with both teacher and administrator respondents, an objective was counted as one which was taught by the testing date if either the administrator indicated this or at least three-fourths of its students were in buildings where at least 75 percent of the teacher respondents had taught it.

Table 17
Grade 5 Mathematics
District-Level Results for Ratings of Whether Objectives Were Taught by the Testing Date*

Obj.	Total No. of Districts Responding	Districts With Only Teacher Respondents			Districts With Only Administrator Respondents			Districts With Both Teacher and Administrator Respondents			Total No. of Dist. Reporting Obj. Was Taught	
		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught			
			No.	%		No.	%		No.	%	No.	%
1	445	141	141	100.0	4	4	100.0	300	300	100.0	445	100.0
2	445	141	141	100.0	4	4	100.0	300	300	100.0	445	100.0
3	445	141	141	100.0	4	4	100.0	300	300	100.0	445	100.0
4	445	141	139	98.6	4	4	100.0	300	299	99.7	442	99.3
5	445	141	140	99.3	4	4	100.0	300	300	100.0	444	99.8
6	445	141	140	99.3	4	4	100.0	300	299	99.7	443	99.6
7	445	142	131	92.3	4	4	100.0	299	291	97.3	426	95.7
8	445	141	141	100.0	4	4	100.0	300	300	100.0	445	100.0
9	445	141	136	96.5	5	5	100.0	299	299	100.0	440	98.9
10	445	141	139	98.6	4	4	100.0	300	297	99.0	440	98.9
11	445	140	45	32.1	5	5	100.0	300	196	65.3	246	55.3
12	445	142	73	51.4	6	6	100.0	297	228	76.8	307	69.0
13	445	142	55	38.7	5	5	100.0	298	211	70.8	271	60.9
14	445	143	67	46.9	5	5	100.0	297	228	76.8	300	67.4
15	445	142	83	58.5	6	6	100.0	297	249	83.8	338	76.0
16	445	141	69	48.9	4	4	100.0	300	220	73.3	293	65.8
17	445	140	35	25.0	4	4	100.0	301	173	57.5	212	47.6
18	445	140	35	25.0	5	4	80.0	300	159	53.0	198	44.5
19	445	142	134	94.4	5	5	100.0	298	297	99.7	436	98.0
20	445	141	119	84.4	5	5	100.0	299	291	97.3	415	93.3
21	445	143	140	97.9	5	5	100.0	297	297	100.0	442	99.3
22	445	143	107	74.8	5	5	100.0	297	277	93.3	389	87.4
23	445	139	60	43.2	4	4	100.0	302	230	76.2	294	66.1
24	445	140	26	18.6	6	5	83.3	299	165	55.2	196	44.0
25	445	141	30	21.3	5	5	100.0	299	170	56.9	205	46.1

* For districts with only teacher respondents, an objective was counted as one which was taught by the district if at least three-fourths of its students were in buildings where at least 75 percent of the teacher respondents had taught it. For districts with only administrator respondents, an objective was counted as one which was taught if the administrator indicated that it was taught at some time in the district's curriculum prior to the testing. For districts with both teacher and administrator respondents, an objective was counted as one which was taught by the testing date if either the administrator indicated this or at least three-fourths of its students were in buildings where at least 75 percent of the teacher respondents had taught it.

Table 18

Grade 8 Mathematics
District-Level Results for Ratings of Whether
Objectives Were Taught by the Testing Date*

Obj.	Total No. of Districts Responding	Districts With Only Teacher Respondents			Districts With Only Administrator Respondents			Districts With Both Teacher and Administrator Respondents			Total No. of Dist. Reporting Obj. Was Taught	
		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught			
			No.	%		No.	%		No.	%	No.	%
1	428	158	155	98.1	12	12	100.0	258	257	99.6	424	99.1
2	428	158	157	99.4	12	12	100.0	258	258	100.0	427	99.8
3	428	158	149	94.3	12	12	100.0	258	255	98.8	416	97.2
4	428	158	152	96.2	12	12	100.0	258	256	99.2	420	98.1
5	428	159	154	96.9	13	12	92.3	256	254	99.2	420	98.1
6	428	159	148	93.1	12	12	100.0	257	255	99.2	415	97.0
7	428	158	151	95.6	12	12	100.0	258	256	99.2	419	97.9
8	428	159	155	97.5	12	12	100.0	257	255	99.2	422	98.6
9	428	158	156	98.7	12	12	100.0	258	258	100.0	426	99.5
10	428	158	155	98.1	12	11	91.7	258	258	100.0	424	99.1
11	428	158	155	98.1	12	12	100.0	258	257	99.6	424	99.1
12	428	159	156	98.1	12	12	100.0	257	257	100.0	425	99.3
13	428	158	150	94.9	12	12	100.0	258	254	98.4	416	97.2
14	428	157	48	30.6	12	10	83.3	259	187	72.2	245	57.2
15	428	157	44	28.0	12	10	83.3	259	181	69.9	235	54.9
16	428	158	52	32.9	12	10	83.3	258	200	77.5	262	61.2
17	428	160	81	50.6	13	11	84.6	255	193	75.7	285	66.6
18	428	158	40	25.3	13	9	69.2	257	151	58.8	200	46.7
19	428	158	137	86.7	12	10	83.3	258	253	98.1	400	93.5
20	428	158	135	85.4	12	11	91.7	258	248	96.1	394	92.1
21	428	157	143	91.1	13	12	92.3	258	258	100.0	413	96.5
22	428	157	19	12.1	12	8	66.7	259	161	62.2	188	43.9
23	428	159	27	17.0	12	9	75.0	257	179	69.6	215	50.2
24	428	158	62	39.2	12	9	75.0	258	189	73.3	260	60.7

Table 18 (Cont'd)

Grade 8 Mathematics
District-Level Results for Ratings of Whether Objectives Were Taught by the Testing Date*

Obj.	Total No. of Districts Responding	Districts With Only Teacher Respondents			Districts With Only Administrator Respondents			Districts With Both Teacher and Administrator Respondents			Total No. of Dist. Reporting Obj. Was Taught	
		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught		No. of Dist.	Dist. Reporting Obj. Was Taught			
			No.	%		No.	%		No.	%	No.	%
25	428	159	65	40.9	12	8	66.7	257	192	74.7	265	61.9
26	428	163	61	37.4	14	7	50.0	251	182	72.5	250	58.4
27	428	162	65	40.1	14	9	64.3	252	161	63.9	235	54.9
28	428	161	103	64.0	13	11	84.6	254	207	81.5	321	75.0
29	428	163	94	57.7	12	11	91.7	253	214	84.6	319	74.5
30	428	163	86	52.8	13	9	69.2	252	202	80.2	297	69.4
31	428	163	91	55.8	13	9	69.2	252	209	82.9	309	72.2
32	428	163	137	84.0	12	12	100.0	253	243	96.0	392	91.6
33	428	163	153	93.9	12	12	100.0	253	250	98.8	415	97.0
34	428	163	137	84.0	12	10	83.3	253	239	94.5	386	90.2

* For districts with only teacher respondents, an objective was counted as one which was taught by the district if at least three-fourths of its students were in buildings where at least 75 percent of the teacher respondents had taught it. For districts with only administrator respondents, an objective was counted as one which was taught if the administrator indicated that it was taught at some time in the district's curriculum prior to the testing. In the few cases in which two administrators responded from the same district, both had to agree that an objective was taught for it to be counted as one which was taught prior to the testing. For districts with both teacher and administrator respondents, an objective was counted as one which was taught by the testing date if either the administrator indicated this or at least three-fourths of its students were in buildings where at least 75 percent of the teacher respondents had taught it.

Investigation of Relationships Between the Teaching of an Objective and Student Achievement On It

The examination of how the teaching of objectives relates to student achievement on them is much more complex when such an investigation must take place at the state level rather than the individual classroom level. If one is teaching new material to students, one can determine at the end of such teaching whether it has been successful, simply by testing students using items directly measuring what has been taught.

At the state level, many variables must be taken into account if one is to adequately examine such relationships. For example, if one were to compare the achievement of students in buildings whose teachers reported teaching all of the grade 3 mathematics objectives with that of students in buildings which were among those which taught the fewest of these objectives, one would be faced with the problems of comparing groups which could be markedly different in other respects than the survey responses of their teachers. It is probable, for example, that higher proportions of high socioeconomic status buildings are able to teach all of the grade 3 math objectives by the testing date because of the generally high achievement levels of their students, with the opposite situation being true for low socioeconomic status buildings.

To complicate matters, comparisons of the survey results with the 1987 percentages of correct response for each objective, shown in Appendix A, lead to the conclusion that little relationship exists. Many of the objectives which were found to be among those taught in the lowest percentages of buildings are among those for which student achievement was highest. Many of those objectives in the lists which were taught in the lowest percentages of buildings at the grade 3, 5 or 8 levels did not have to be taught because they were not difficult or were learned well at lower grade levels or outside of school.

Because of such complications it was decided to examine the desired relationships using a relatively new technique, now being utilized primarily to investigate whether specific test items are biased against particular groups. This technique, termed the differential item functioning method,

or DIF, controls for overall differences in the achievement levels of the two populations being studied by comparing the functioning on specific items of subgroups with exactly the same total test scores. (see Dorans and Kulick, 1986). Thus, a summarization of differences in the percentages correct on an item is formed for subgroups from each population who have obtained each possible score on the test. Arbitrary criteria are used to flag items which appear biased. Used in this flagging are two computed values, the standardized p-difference (D_{STD}) and the root mean squared difference (RMWSTD). It has been found useful by the developers of DIF to flag items as possible bias candidates if either the standardized p-difference is .05 or greater or RMWSTD is .08 or greater.

The application of this technique in the present study was viewed as a piloting to determine its utility and also as a means of obtaining valuable information which would not otherwise have been possible to gather. The DIF technique provides a control over student achievement which was needed in the present study in comparing populations which could be very different overall. It also produces plots of results for each score level, thus making it possible to examine at which achievement levels the greatest differences existed.

It would have been desirable to carry out such analyses for every objective of the six lists for which there truly was an Untaught group. However, the large number of objectives being examined made this prohibitive. This was the case especially because a different Taught and Untaught group of buildings would have had to have been formed for each objective.

In using DIF in the present study it was decided to form groups of students who were in buildings where 100% of the teachers taught an objective and compare their results on the items of the objective with that of students who were in buildings where none of the responding teachers reported teaching the objective. The computer program used for these analyses is one which is being developed by Richard Kohr of the Pennsylvania Department of Education. At present the program requires that groupings of total scores must be used since only 24 subgroups can be compared at the same time. In the present study this generally meant that, instead of comparing the results for subgroups of students with each possible total score, groupings made up of two or

three score points had to be used to form the subgroups. Because this increased the numbers of students in each subgroup, it would be expected that RMWSTD would be decreased somewhat over that typically found for individual score points. To examine its impact in terms of the overall pattern of differences between the focal group (students who were not taught the objective) and the base group (students who were taught the objective), each analysis to be reported was run three times - using the total score range, grouped as described; using only the bottom subgroups of individual total scores; and using only the top subgroups of individual total scores. Generally it can be said that the same pattern of difference was found, whether grouped or ungrouped data was used, but the grouping was assumed to have had some undetermined impact upon the standardized p-difference.

Shown in Tables 19 and 20 are the DIF results for selected reading and mathematics objectives. The total number of student scores entering into an analysis ranged from 77,519 for objective 6 of grade 3 reading to 58,599 for objective 24 of grade 8 reading. Typically the Untaught group was smaller than the Taught group, but this depended solely upon the numbers of buildings for each objective for which either all teachers taught it or for which no teachers taught it. Tables 1 through 6 can be consulted for a very good estimate of the number of buildings involved in each analysis. Almost all of those shown in the "0% through 24.9%" and the "75% through 100%" columns for the particular objectives of the DIF analyses were included, since most of the buildings in these columns met the criteria of either no teachers or all teachers having taught the listed objectives. The smallest number of students in either the Taught or the Untaught group was 3,258 in the Untaught group of objective 11, grade 3 reading; the largest number in a group was 72,114 in the Taught group for the same objective. The number of students who were categorized into a particular subgroup of the possible 24 ranged from 14 to 9,626. However, when the analyses were repeated using individual scores instead of groupings, it was not unusual to find less than ten students in a subgroup.

Because it was possible to conduct DIF analyses for only a portion of the objectives, these were selected carefully. For the reading objectives, analyses were first conducted for the four comprehension objectives shown in Table 19. At can be seen in this table, no standardized p-differences

Table 19
Differential Item Functioning (DIF) Results
for Selected Reading Objectives

Grade	Objective Examined			Test Item No.	Standardized P-Difference (D_{STD})*	Root Mean Weighted Squared Difference (RMWSTD)
	Obj#	Category	Description			
3	6	Literal Comprehension	Stated Cause & Effect	20	.00	.02
				32	.00	.04
				57	- .01	.03
				62	- .01	.03
	11	Inferential Comprehension	Characterization	22	- .01	.04
				27	.00	.03
				52	- .02	.03
				54	.00	.04
				61	- .01	.03
5	12	Inferential Comprehension	Figurative Language	11	- .01	.03
				12	.00	.02
				13	.00	.03
				14	- .02	.03
	16	Life/Study & Reference	Using an Index	45	- .01	.04
				46	- .03	.04
				47	.00	.03
8	16	Inferential Comprehension	Implied Similar./Differ.	17	.00	.02
				66	.00	.02
	24	Life/Study & Reference	Completing Forms	51	- .01	.02
				52	.01	.02
				53	.00	.01

*Negative values indicate differences favoring the Taught group (base group). Positive values indicate differences favoring the Untaught group (focal group).

Table 20
Differential Item Functioning (DIF) Results
for Selected Mathematics Objectives

Grade	Objective Examined			Test Item No.	Standardized P-Difference (D_{STD})*	Root Mean Weighted Squared Difference (RMWSTD)
	Obj#	Category	Description			
3	9	Whole Numbers: Division	Division/ Basic Facts	88	- .15	.18
				89	- .07	.08
				90	- .14	.16
	13	Fractions	Fractional Regions	100	- .06	.09
				101	- .07	.09
				102	- .02	.03
5	12	Fractions	Add/Subtract Fractions/Like Denominators	115	- .10	.12
				116	- .09	.11
				117	- .12	.13
	13	Fractions	Comparing Fractions	109	.00	.06
				110	- .09	.09
				111	- .09	.09
	24	Geometry	Solid Figures	143	- .01	.02
				144	.00	.01
				145	.00	.01
8	22	Graphing	Circle Graphs	132	- .01	.02
				133	- .02	.02
				134	.00	.01
	24	Geometry	Line Relationships	135	- .08	.09
				136	- .02	.03
				137	- .06	.07

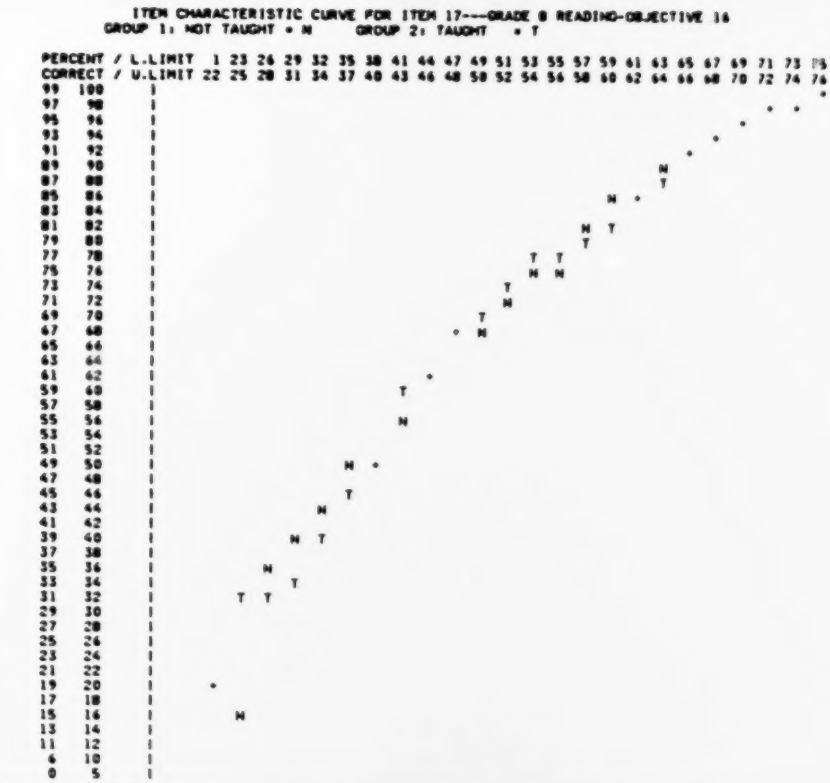
*Negative values indicate differences favoring the Taught group (base group). Positive values indicate differences favoring the Untaught group (focal group).

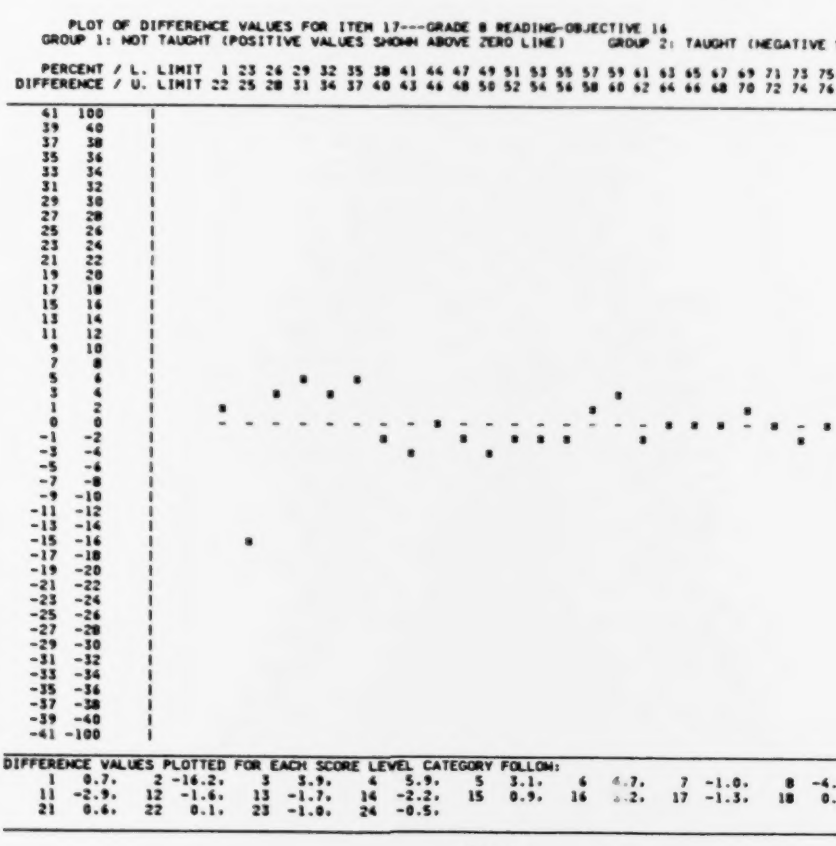
which would have flagged any of the items of these objectives were found, nor were any sizable RMWSTD uncovered.

Both objective 16 at the grade 5 level and objective 24 at the grade 8 level were then chosen for examination, primarily because they appeared to be ones which might be subject to lower scores for students who had not been taught them recently. As is evident in Table 19, the differences for these items were no greater than were those for the comprehension objectives. Figures 1 and 2 were prepared to picture the differences found for two of the reading items, one of those for objective 16 of grade 8 (Figure 1) and the item of objective 16 of grade 5 for which the largest standardized p-difference was found (Figure 2). The pattern for each is one of very similar results for the Taught and Untaught groups, no matter which score level was plotted. Interestingly, for the item which attained the greatest standardized p-difference, the pattern plotted is one favoring the Taught group at most score levels. These differences were not strong enough for the item to be flagged, but they do seem to point to some degree of trend in the expected direction.

In choosing the mathematics objectives to examine, those which seemed most obvious were ones typically taught for the first time at the grade level at which they were assessed, objectives such as number 9, Division, of grade 3 mathematics and four of the five Fractions objectives of grade 5, numbers 12 through 15. As shown in Table 20 and in Figure 3, rather profound differences were found for all but one of the nine items of this type examined and these differences favored the Taught group. For these objectives and for all others shown in Table 20, the RMWSTD criterion would have flagged only items which were also flagged by the D_{STD} criterion.

After documenting that such large differences could be found, objectives were chosen which were hypothesized to show both lesser differences and no differences at all. Since the Fractional Regions objective of grade 3 had generally been taught in grade 2 and also learned outside of school, it was not expected to show major differences. However, the results for two items of this objective would have been flagged as ones favoring the Taught group and, as shown in Figure 4, for these items the differences in performance of Taught and Untaught students were much a


ITEM CHARACTERISTIC CURVE FOR ITEM 17---GRADE 8 READING-OBJECTIVE 16
GROUP 1: NOT TAUGHT • N GROUP 2: TAUGHT • T
PERCENT / L.LIMIT 1 23 26 29 32 35 38 41 44 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75
CORRECT / U.LIMIT 22 25 28 31 34 37 40 43 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76

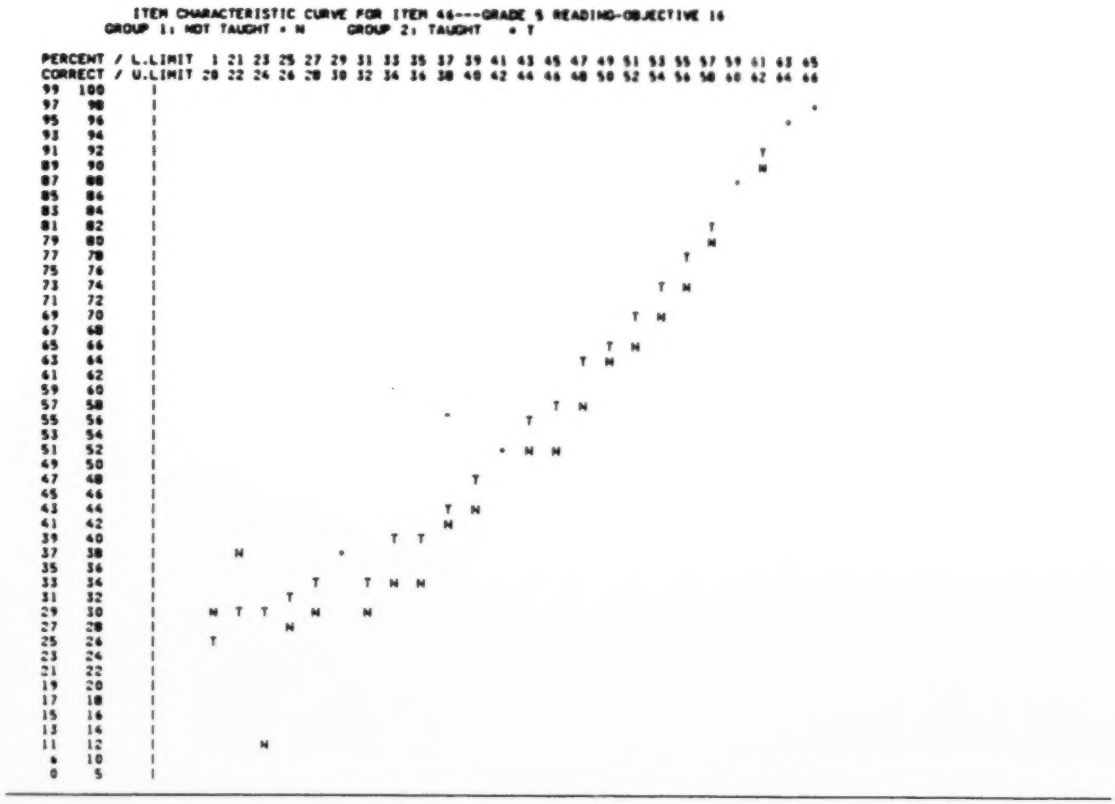

PLOT OF DIFFERENCE VALUES FOR ITEM 17---GRADE 8 READING-OBJECTIVE 16
GROUP 1: NOT TAUGHT (POSITIVE VALUES SHOWN ABOVE ZERO LINE) GROUP 2: TAUGHT (NEGATIVE VALUES SHOWN BELOW ZERO LINE)
PERCENT / L. LIMIT 1 23 26 29 32 35 38 41 44 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75
DIFFERENCE / U. LIMIT 22 25 28 31 34 37 40 43 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76

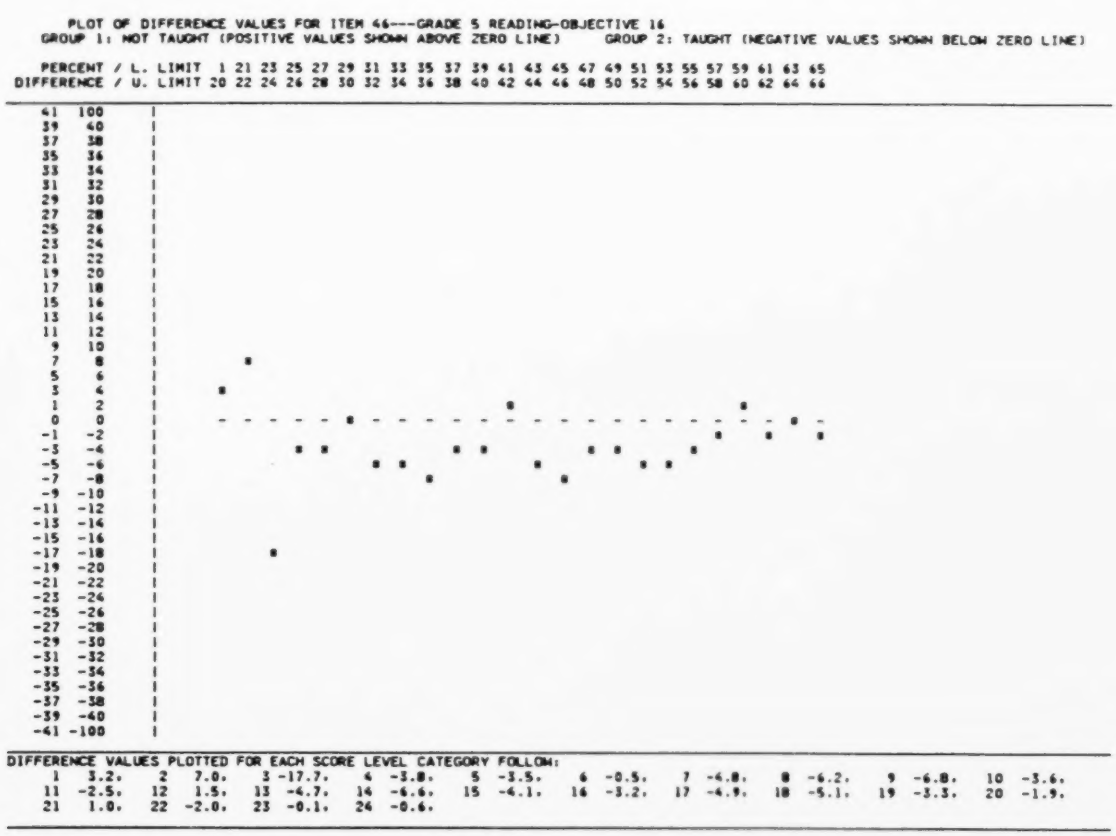
DIFFERENCE VALUES PLOTTED FOR EACH SCORE LEVEL CATEGORY FOLLOW:

1	0.7.	2	-16.2.	3	3.9.	4	5.9.	5	3.1.	6	4.7.	7	-1.0.	8	-4.1.	9	0.3.	10	-0.8.
11	-2.9.	12	-1.6.	13	-1.7.	14	-2.2.	15	0.9.	16	1.2.	17	-1.3.	18	0.3.	19	0.2.	20	-0.4.
21	0.6.	22	0.1.	23	-1.0.	24	-0.5.												

FIGURE 1

ITEM CHARACTERISTIC CURVE AND PLOT OF DIFFERENCES FOR
ITEM 17, OBJECTIVE 16 (IMPLIED SIMILARITY/DIFFERENCE) OF GRADE 8 READING


ITEM CHARACTERISTIC CURVE FOR ITEM 46---GRADE 5 READING-OBJECTIVE 16
GROUP 1: NOT TAUGHT = N GROUP 2: TAUGHT = T
PERCENT / L.LIMIT 1 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65
CORRECT / U.LIMIT 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66

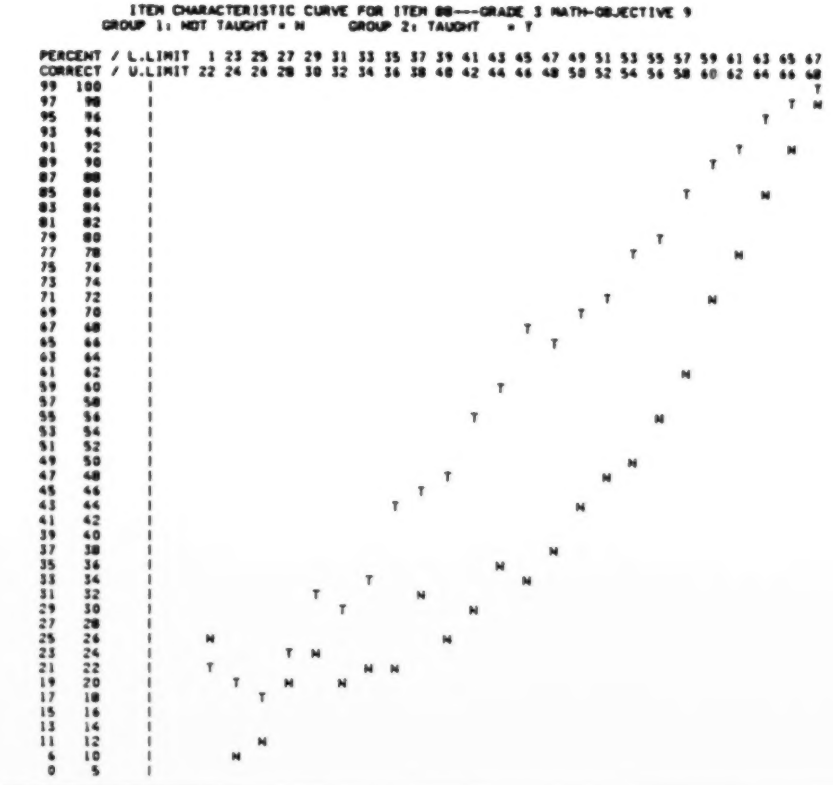

PLOT OF DIFFERENCE VALUES FOR ITEM 46---GRADE 5 READING-OBJECTIVE 16
GROUP 1: NOT TAUGHT (POSITIVE VALUES SHOWN ABOVE ZERO LINE) GROUP 2: TAUGHT (NEGATIVE VALUES SHOWN BELOW ZERO LINE)
PERCENT / L. LIMIT 1 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65
DIFFERENCE / U. LIMIT 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66

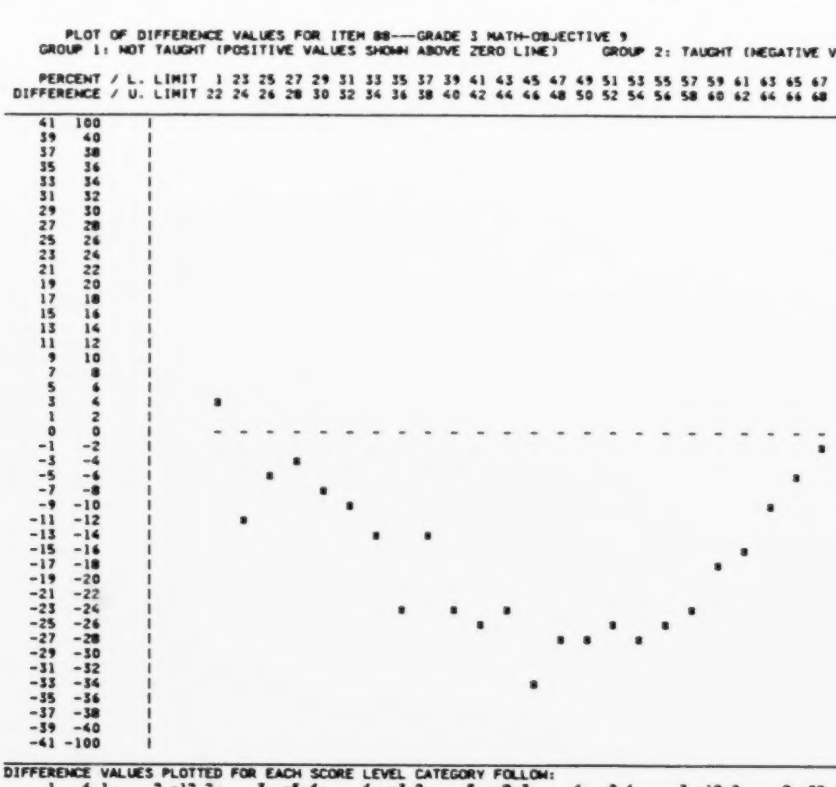
DIFFERENCE VALUES PLOTTED FOR EACH SCORE LEVEL CATEGORY FOLLOW:

1	3.2.	2	7.0.	3	-17.7.	4	-3.8.	5	-3.5.	6	-0.5.	7	-4.8.	8	-6.2.	9	-6.8.	10	-3.6.
11	-2.5.	12	1.5.	13	-4.7.	14	-6.6.	15	-4.1.	16	-3.2.	17	-4.9.	18	-5.1.	19	-3.3.	20	-1.9.
21	1.0.	22	-2.0.	23	-0.1.	24	-0.6.												

FIGURE 2

ITEM CHARACTERISTIC CURVE AND PLOT OF DIFFERENCES FOR
ITEM 46, OBJECTIVE 16 (USING AN INDEX) OF GRADE 5 READING



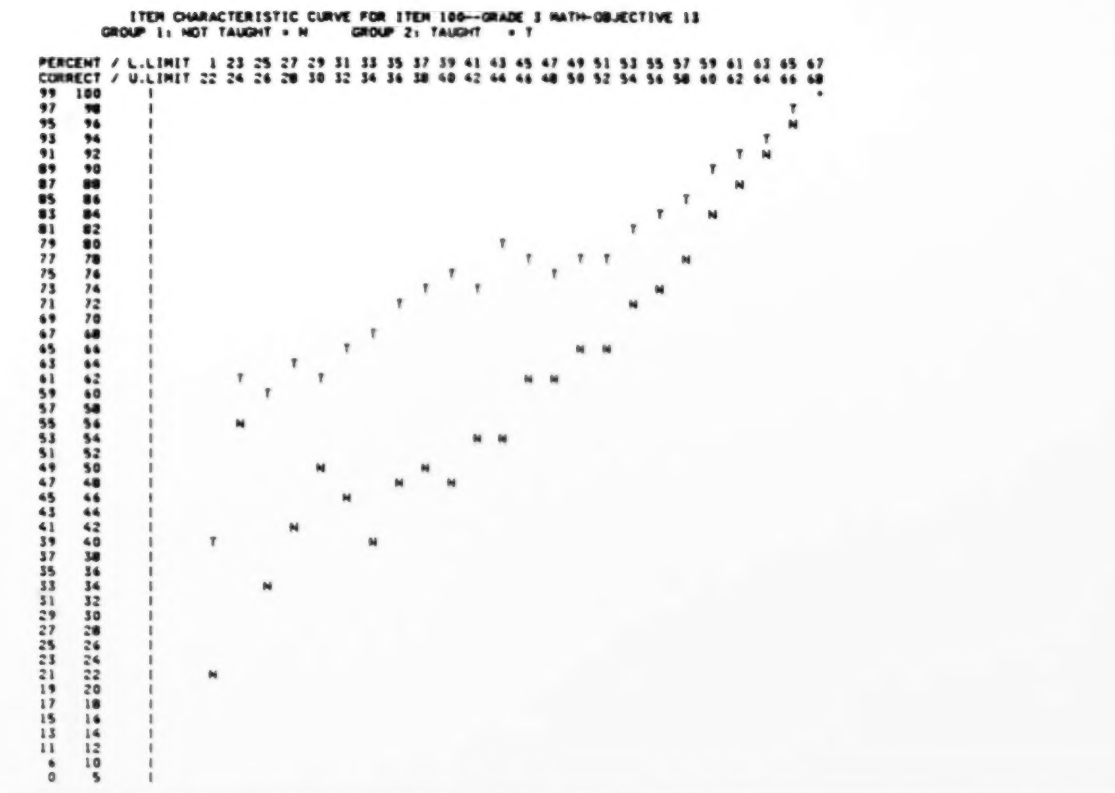

PLOT OF DIFFERENCE VALUES FOR ITEM 88---GRADE 3 MATH-OBJECTIVE 9
GROUP 1: NOT TAUGHT (POSITIVE VALUES SHOWN ABOVE ZERO LINE) GROUP 2: TAUGHT (NEGATIVE VALUES SHOWN BELOW ZERO LINE)
PERCENT / L. LIMIT 1 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67
DIFFERENCE / U. LIMIT 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68

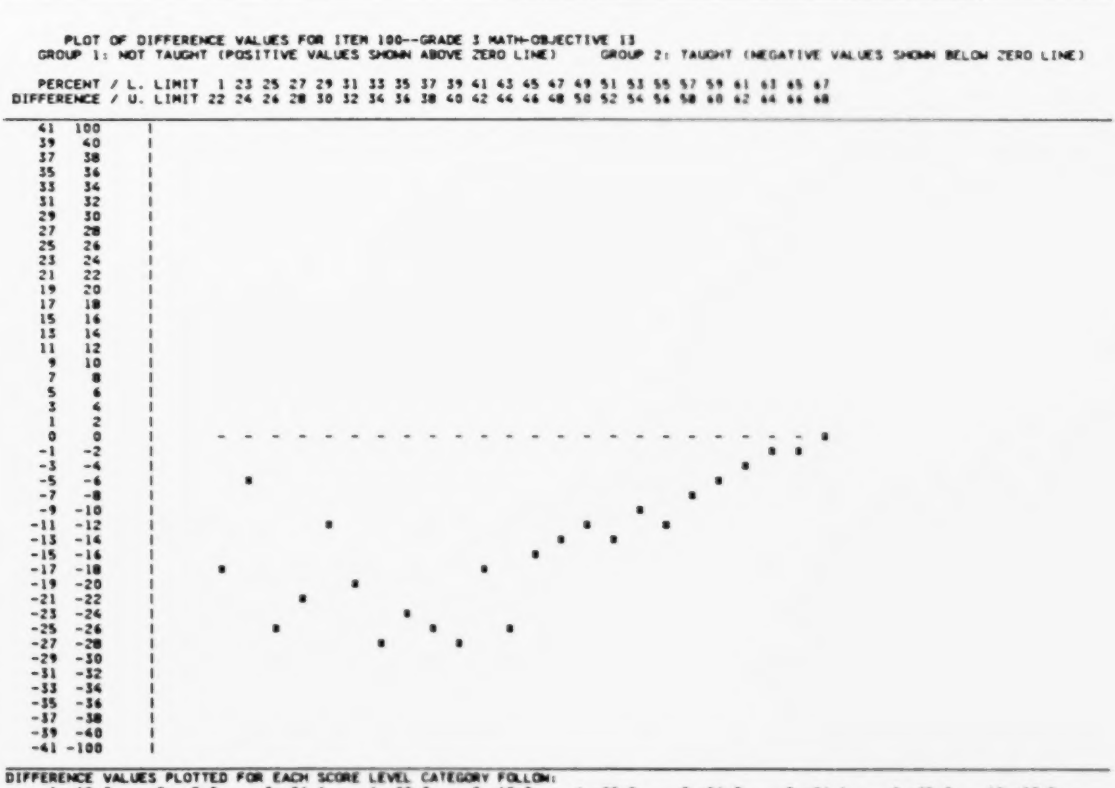
DIFFERENCE VALUES PLOTTED FOR EACH SCORE LEVEL CATEGORY FOLLOW:

1 4.1.	2 -12.2.	3 -5.4.	4 -3.2.	5 -8.3.	6 -9.6.	7 -12.9.	8 -22.6.	9 -13.3.	10 -22.6.
11 -25.1.	12 -24.3.	13 -32.9.	14 -28.2.	15 -27.1.	16 -25.6.	17 -27.5.	18 -25.3.	19 -24.0.	20 -17.4.
21 -15.3.	22 -10.3.	23 -5.9.	24 -0.9.						

FIGURE 3

ITEM CHARACTERISTIC CURVE AND PLOT OF DIFFERENCES FOR
ITEM 88, OBJECTIVE 9 (DIVISION) OF GRADE 3 MATHEMATICS




PLOT OF DIFFERENCE VALUES FOR ITEM 100--GRADE 3 MATH-OBJECTIVE 13
GROUP 1: NOT TAUGHT (POSITIVE VALUES SHOWN ABOVE ZERO LINE) GROUP 2: TAUGHT (NEGATIVE VALUES SHOWN BELOW ZERO LINE)
PERCENT / L. LIMIT 1 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67
DIFFERENCE / U. LIMIT 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68

DIFFERENCE VALUES PLOTTED FOR EACH SCORE LEVEL CATEGORY FOLLOW:

1 -18.3.	2 -5.5.	3 -26.4.	4 -20.7.	5 -12.3.	6 -20.2.	7 -26.7.	8 -24.1.	9 -25.3.	10 -27.5.
11 -18.4.	12 -25.5.	13 -15.4.	14 -12.9.	15 -10.9.	16 -12.8.	17 -10.3.	18 -11.3.	19 -7.7.	20 -5.6.
21 -3.7.	22 -2.5.	23 -1.6.	24 -0.2.						

FIGURE 4

ITEM CHARACTERISTIC CURVE AND PLOT OF DIFFERENCES FOR
ITEM 100, OBJECTIVE 13 (SHADED FRACTIONAL PART) OF GRADE 3 MATHEMATICS

function of students at the lower score ranges. These results were found even though the overall percentage correct for the objective was 89.

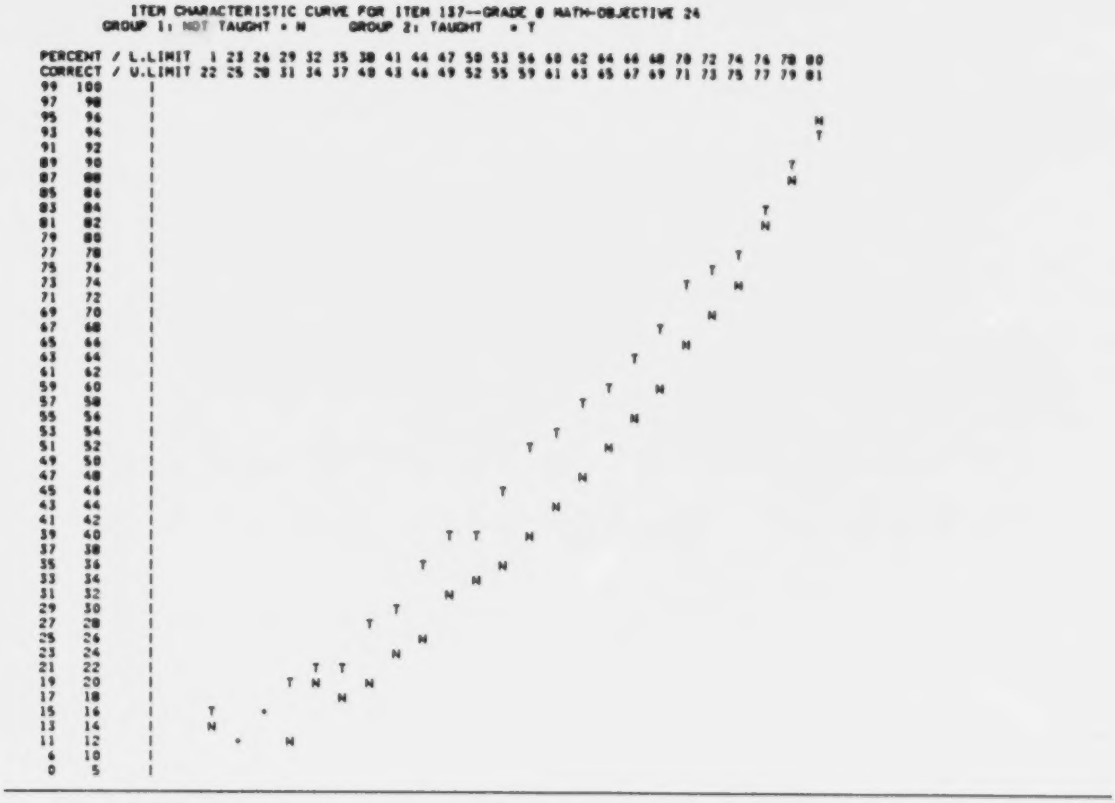
The Line Relationships objective of grade 8 was next chosen as one which would be expected to show some differences, primarily because it required specific knowledge which could be forgotten if not recently reviewed. This appeared to be the case for two of the three items. As shown in Figure 5, relatively small but consistent differences were found at almost all score levels.

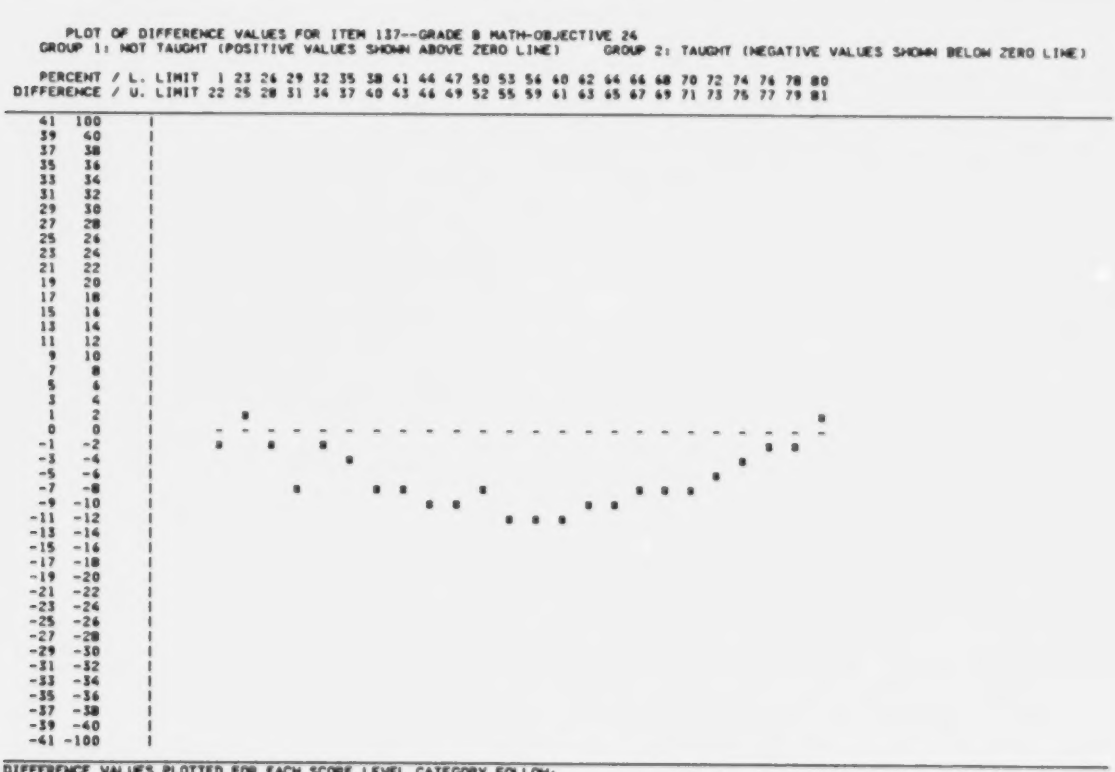
Finally, objective 24 of grade 5 and objective 22 of grade 8 were picked out as objectives which would not be expected to show differences. These had been learned over time, were not difficult skills and could have been learned both in other subject areas and outside of school. As shown in Table 20 and Figure 6, such expectations were borne out.

DISCUSSION AND CONCLUSIONS

The results of the study provided two important types of information. First, data were generated which were useful in examining the instructional validity of the Essential Skills tests. The survey approach did provide quite a lot of information and, in general, it did support the statement that the tests are instructionally valid. This was especially the case for reading.

The second type of information gathered in the study was methodological in nature. The survey approach did function relatively well, but there were apparent difficulties. One such difficulty was in interpreting the administrator results. They appeared to be providing curricular validity information rather than instructional validity information but did not appear to do this particularly well, since there were objectives taught at lower levels which were not taken into account by administrators in providing their ratings. It appears that these ratings should be viewed primarily as curricular validity results and possibly ones which were limited by some administrators to the particular grade levels being studied rather than as ones which generally took into consideration what was taught at all earlier levels. In the present study it was particularly important that ratings be obtained of what was taught at the grade levels prior to each of the tested grade levels because



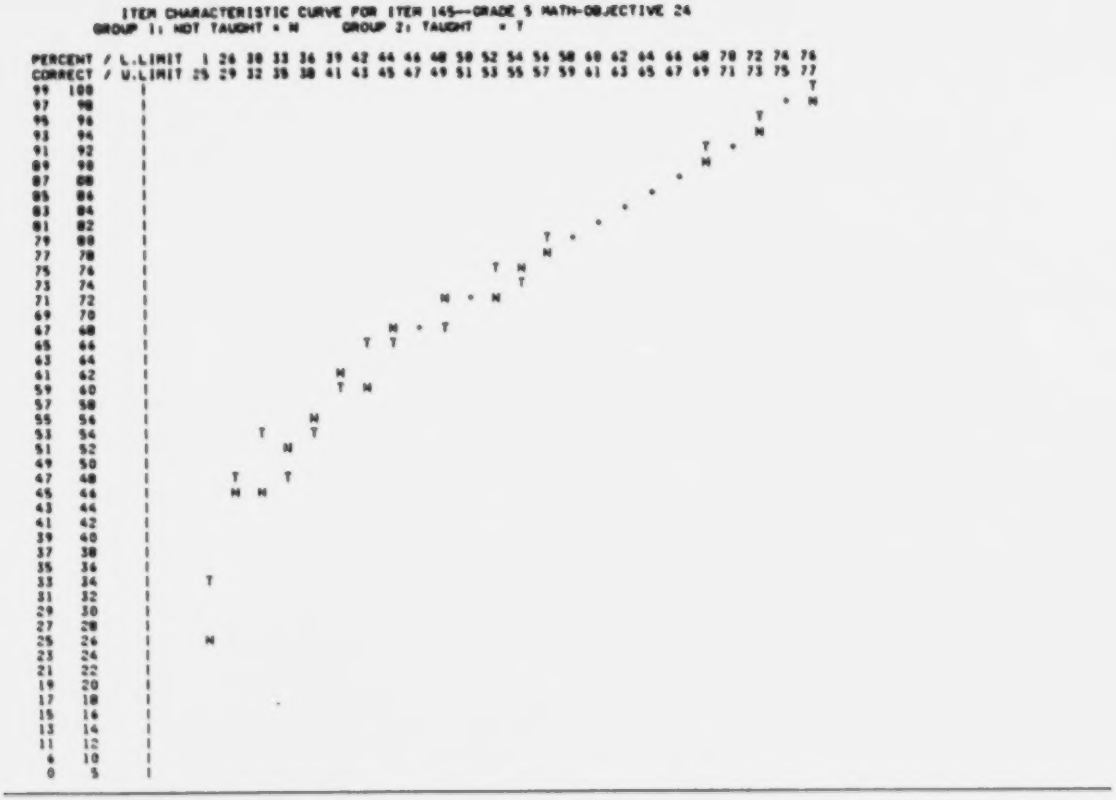

PLOT OF DIFFERENCE VALUES FOR ITEM 137--GRADE 8 MATH-OBJECTIVE 24
GROUP 1: NOT TAUGHT (POSITIVE VALUES SHOWN ABOVE ZERO LINE) GROUP 2: TAUGHT (NEGATIVE VALUES SHOWN BELOW ZERO LINE)
PERCENT / L. LIMIT 1 23 26 29 32 35 38 41 44 47 50 53 56 60 62 64 66 68 70 72 74 76 78 80
DIFFERENCE / U. LIMIT 22 25 28 31 34 37 40 43 46 49 52 55 59 61 63 65 67 69 71 73 75 77 79 81

DIFFERENCE VALUES PLOTTED FOR EACH SCORE LEVEL CATEGORY FOLLOW:

1	-1.5.	2	0.8.	3	-0.8.	4	-7.0.	5	-0.6.	6	-6.4.	7	-8.4.	8	-7.6.	9	-8.8.	10	-8.7.
11	-6.8.	12	-10.7.	13	-11.1.	14	-11.0.	15	-10.0.	16	-9.1.	17	-7.9.	18	-7.1.	19	-7.8.	20	-4.8.
21	-4.0.	22	-1.7.	23	-0.8.	24	0.7.												

FIGURE 5

ITEM CHARACTERISTIC CURVE AND PLOT OF DIFFERENCES FOR
ITEM 137, OBJECTIVE 24 (LINE RELATIONSHIPS) OF GRADE 8 MATHEMATICS



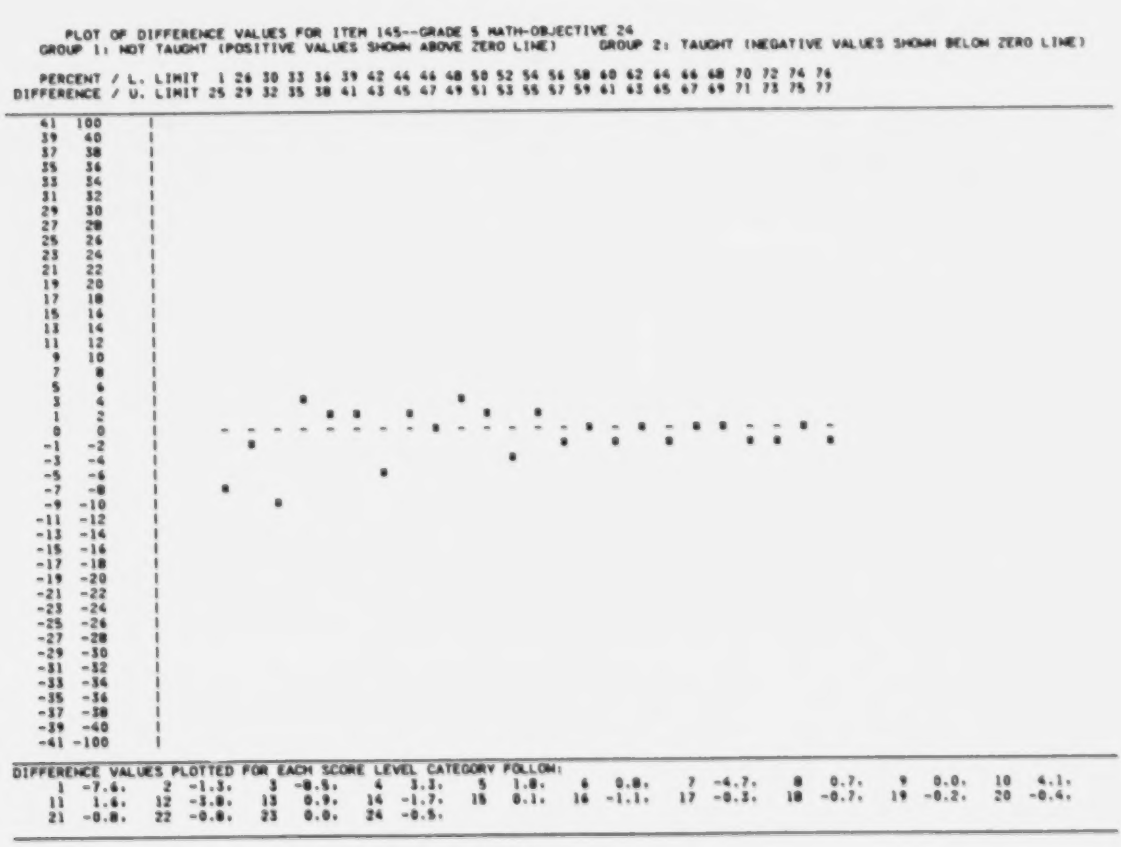

PLOT OF DIFFERENCE VALUES FOR ITEM 145--GRADE 5 MATH-OBJECTIVE 24
GROUP 1: NOT TAUGHT (POSITIVE VALUES SHOWN ABOVE ZERO LINE) GROUP 2: TAUGHT (NEGATIVE VALUES SHOWN BELOW ZERO LINE)
PERCENT / L. LIMIT 1 26 30 33 36 39 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76
DIFFERENCE / U. LIMIT 25 29 32 35 38 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75 77
DIFFERENCE VALUES PLOTTED FOR EACH SCORE LEVEL CATEGORY FOLLOW:
1 -7.6. 2 -1.3. 3 -8.5. 4 3.3. 5 1.8. 6 0.8. 7 -4.7. 8 0.7. 9 0.0. 10 4.1.
11 1.6. 12 -3.8. 13 0.9. 14 -1.7. 15 0.1. 16 -1.1. 17 -0.3. 18 -0.7. 19 -0.2. 20 -0.4.
21 -0.8. 22 -0.8. 23 0.0. 24 -0.5.

FIGURE 6

ITEM CHARACTERISTIC CURVE AND PLOT OF DIFFERENCES FOR
ITEM 145, OBJECTIVE 24 (SOLID FIGURES) OF GRADE 5 MATHEMATICS

57

the objectives of the lists were developed to focus upon some material which would be typically taught at earlier grade levels. The thinking of the committees involved in deliberations about which objectives to include was that certain objectives taught at earlier levels were extremely important and should be included since only three levels were being tested. Thus, a specific fourth grade objective could have been placed in the fifth grade list because it was considered to be highly important and could not be tested at the fourth grade level. Because of the ambiguity of the administrator ratings, a better approach than the one carried out might have been to survey a sample of teachers at grades 2, 4, 6 and 7 in addition to those teachers surveyed. This would have made it possible to document whether the objectives under study were actually taught in other grade levels rather than just having a place in curriculum guides.

At the time the survey instrument was developed a great deal of thought went into the decision of whether to provide only objectives for rating or whether there was a need for teachers to examine specific items. It was decided that, after two years of experience with the objectives and with all the publicity about these the teachers had received, these particular raters could be expected to interpret what was meant by each objective statement without seeing specific items. The survey was also sent out near the time of the students' testing, so teachers who felt a bit unsure about a particular objective's meaning could consult the questions while their students were being tested. Another difficulty with providing items for rating was the test security problems this would cause, since some items are typically used in more than one year. In addition, a great deal of time would have been needed for teachers to examine specific reading items where paragraphs had to be read. All in all, the decision to use only objectives in the rating study appeared not to weaken it. As one evidence of this, very few comments were written by survey respondents which described difficulties in responding due to unfamiliarity with an objective's meaning.

Because the administrator ratings did not effectively provide the desired instructional validity information, analyses of the survey comments became especially important. Statements that the tests appear to have instructional validity are strengthened by findings in the comments that a particular objective not found to be routinely taught at the grade level being studied was often addressed at earlier grade levels.

The analyses of achievement relationships which were undertaken were helpful in understanding the survey results. An examination of the percentages of items answered correctly for each objective makes it clear that for certain objectives a great deal of formal teaching was not needed at the grade 3, 5 or 8 levels. Students do accumulate knowledge as they progress through school. Some of this is gathered in reading and mathematics, but other information important to answering Essential Skills items correctly may have been gathered in other subject areas, at other grade levels or in the everyday life of students outside of school.

One strong point of the study was the use of the DIF approach. The mathematics achievement differences which were found for certain objectives helped validate the survey findings, providing evidence that the Taught and Untaught groups truly were as described by their teachers. In addition, the technique functioned well as an analytical tool, especially in light of the difficulties of some past investigators in isolating achievement differences attributable to differences in instructional exposure. It was possible in the study to identify a number of patterns of difference between the performance of Taught and Untaught students for the few mathematics objectives for which analyses were performed. These suggested that such patterns may be a function of the type of skill involved, e.g., ones which were being learned for the first time, ones which were taught previously but still required review for most students, ones which seemed to require review primarily for lower ability students, and ones which were not difficult and seemed to require little review for any students. The fact that no differences were identified between the achievement of Taught and Untaught students on the few reading items which were studied could be due to the types of differences in reading and mathematics content described by Lewy (1972). Further use of the DIF technique in analysis situations similar to that of the present study seems warranted on the basis of its performance in the study.

The survey which was performed, then, provided much information about the Essential Skills objectives. This information is being used to examine these closely, especially since the number of grade levels involved in the testing program may be increased. If this does take place, some objectives which are now in the grade 3, 5 and 8 lists could be moved to other grade levels. The survey results will be a major factor in decisions about these placements.

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APPENDIX A
1987 READING AND MATHEMATICS OBJECTIVES

Table A.1
1987 GRADE 3 READING OBJECTIVES

CATEGORY	OBJ#	OBJECTIVE	STATE PERCENT CORRECT
VOCABULARY	1	Selects the meaning of an unfamiliar word from the context of two given sentences or a passage.	78
	2	Selects the meaning for a multiple-meaning word from the context of a sentence or a passage.	78
	3	Identifies a word that has the same meaning as an underlined word in the context of a sentence or a passage.	82
	4	Identifies words that have opposite meanings.	74
LITERAL COMPREHENSION	5	Identifies a detail or explicit information directly stated in a passage.	77
	6	Identifies the cause of an explicitly stated cause-effect relationship occurring within a passage.	77
	7	Identifies the main idea of a passage.	78
	8	Identifies the sequence of events in a passage.	74
INFERENTIAL COMPREHENSION	9	Given four words belonging to the same category or a category title, selects the corresponding title or the four words belonging to the category.	86
	10	Selects the sentence or title that best paraphrases the main idea of a passage.	77
	11	Selects the implied feelings, motives or traits of the character(s) within a passage.	80
	12	Determines the most probable outcome of a passage or of an event in a passage.	80
LIFE/STUDY AND REFERENCE	13	Selects the chapter or page number from a sample table of contents in which specified information can be found.	89
	14	Identifies the alphabetical order of a list of words (1 to 3 letters deep).	81

Table A.2
1987 GRADE 5 READING OBJECTIVES

CATEGORY	OBJ#	OBJECTIVE	STATE PERCENT CORRECT
VOCABULARY	1	Indicates which word or phrase best describes the meaning of an unfamiliar word inferred from the context of a passage.	77
	2	Selects the meaning for a multiple-meaning word from the context of a sentence or a passage.	75
	3	Given a category title, selects a word group in which all words belong to the given category.	85
LITERAL COMPREHENSION	4	Identifies the sentence from a passage that best states the main idea of the passage.	70
	5	Identifies the sequence of events in a passage.	76
	6	Identifies either the cause or the effect of an explicitly stated cause-effect relationship occurring within a passage.	71
	7	Identifies supporting details in a passage.	70

INFERENTIAL COMPREHENSION	8	Selects the sentence or title that best paraphrases the main idea of a passage.	70
	9	Determines the most probable outcome of a passage or of an event in a passage.	74
	10	Determines whether a given statement is a fact or an opinion.	81
	11	Selects the conclusion that can best be inferred from information stated in a passage.	85
	12	Identifies the intended meaning of a statement containing figurative language (idiom, simile or metaphor).	78
	13	Identifies the word or phrase that best describes the character of a person in a passage.	84
LIFE/STUDY AND REFERENCE	14	Given dictionary entries, selects the meaning of a word used in context and identifies appropriate guide words.	82
	15	Given a road map containing a key and a compass rose, selects a direction, a distance or a location.	82
	16	Given an index with main topics, subtopics, and cross-references, selects the page numbers containing the requested information.	77
	17	Given a table that includes six rows under five categories, selects information from each category.	86
	18	Selects an answer arrived at by following directions.	83

Table A.3
1987 GRADE 8 READING OBJECTIVES

CATEGORY	OBJ#	OBJECTIVE	STATE PERCENT CORRECT
VOCABULARY	1	Indicates which word or phrase best describes the meaning of an unfamiliar word inferred from context.	84
	2	Selects the meaning for a multiple-meaning word from context.	70
	3	Identifies a word that has the same meaning as an underlined word.	79
	4	Identifies words that have opposite meanings.	78
LITERAL COMPREHENSION	5	Identifies a detail stated in a passage.	75
	6	Identifies either the cause or the effect of an explicitly stated cause-effect relationship occurring within a passage.	81
	7	Identifies sequence of time, places and events in a story.	80
	8	Identifies the stated main idea in a passage.	80
INFERENTIAL COMPREHENSION	9	Selects the sentence or title that best paraphrases the main idea of a passage.	74
	10	Determines the most probable outcome of a passage or of an event in a passage.	86
	11	Determines whether a given statement is an opinion.	84
	12	Selects the conclusion that can best be inferred from information stated in a passage.	73
	13	Selects the implied cause or the implied effect of a cause-effect relationship occurring within a passage.	77
	14	Selects the sentence containing details that either support or do not support the stated main idea.	73
	15	Determines the author's purpose for writing a passage.	80
	16	Selects either the implied similarity or the implied difference between characters, objects or events in a passage.	68
	17	Identifies the intended meaning of a statement containing figurative language (idiom, simile, metaphor, etc.).	78
	18	Identifies traits or characters of persons on the basis of their actions in a passage.	83
LIFE/STUDY AND REFERENCE	19	Given dictionary entries, selects the meaning of a word used in context.	78
	20	Given a road map containing a key, a scale and a compass rose, selects a direction, a distance or a location.	78

	21	Given an index with main topics, subtopics, and cross-references, selects the page numbers containing the requested information.	58
	22	Given information in table form, answers questions requiring interpretation of the data.	88
	23	Given a diagram with a key, selects numbers or labels in the diagram.	88
	24	Given an application or other form, answers questions about it or about how to complete it.	79
	25	Selects the correctly-drawn diagram (or other illustration) after reading directions for drawing it.	66

Table A.4
1987 GRADE 3 MATHEMATICS OBJECTIVES

CATEGORY	OBJ#	OBJECTIVE	STATE PERCENT CORRECT
WHOLE NUMBERS: ADDITION	1	Given two four-digit addends, finds the sum without renaming.	98
	2	Given three or four two-digit addends, uses renaming once to find the sum.	86
	3	Given two three-digit addends, uses renaming twice to find the sum.	83
WHOLE NUMBERS: SUBTRACTION	4	Given a four-digit number and a three- or four-digit number, finds the difference without renaming.	92
	5	Given a two-digit number and a one- or two-digit number, uses renaming once to find the difference.	82
	6	Given a three-digit number for the minuend and a two-digit number, uses renaming in the tens place to find the difference.	73
WHOLE NUMBERS: MULTIPLICATION	7	Given elementary facts of multiplication, finds the product (products up to and including 50).	94
	8	Given a factor of two digits and a factor of one digit (5 or less), finds the product without renaming.	70
WHOLE NUMBERS: DIVISION	9	Given elementary facts of division with a dividend less than or equal to 50 and a divisor of 5 or less, finds the quotient.	79
NUMERATION	10	Identifies the place value of a specified digit in a whole number and matches a numeral with its expanded form or an expanded numeral with its conventional form.	68
	11	Given two whole numbers less than 1000, identifies which of the two whole numbers is either greater or less.	86
	12	Given pictured objects in groups of hundreds, tens and ones (less than 1000), identifies the equivalent standard numeral.	92
FRACTIONS	13	Given a shape with a shaded fractional part (halves, thirds or fourths), identifies the fractional part shaded.	89
MEASUREMENT	14	Given pictured coins (half dollars, quarters, dimes, nickels and pennies) and pictured one dollar bills, finds the value of the money pictured.	88
	15	Given a pictured clock face showing time at five minute intervals, identifies the correct time.	83
	16	Given a pictured object and a pictured ruler, finds the length of the object to the nearest centimeter and inch.	96
	17	Given a pictured calendar month, identifies information about dates and days of the week.	85
PROBLEM SOLVING	18	Given a story problem requiring addition, subtraction or multiplication, finds the sum, difference or product.	87
	19	Given a story problem requiring the addition or subtraction of money greater and less than a dollar, finds the sum or difference using decimal notation.	76

GRAPHING	20	Given a bar graph scaled by 1, uses the graph by making identifications and comparisons.	96
	21	Given a pictograph (picture graph) scaled by 2, uses the graph by making identifications and comparisons.	57
GEOMETRY	22	Given a pictured circle, rectangle, square, triangle or open or closed curve, identifies the name of the shape.	94
SIGNS AND SYMBOLS	23	Given a number sentence consisting of one- or two-digit numbers, identifies the appropriate symbol to make the operation true.	90

Table A.5
1987 GRADE 5 MATHEMATICS OBJECTIVES

CATEGORY	OBJ#	OBJECTIVE	STATE PERCENT CORRECT
WHOLE NUMBERS: ADDITION	1	Given three four-digit addends or four three-digit addends or a combination of same, uses renaming to find the sum.	91
WHOLE NUMBERS: SUBTRACTION	2	Given two three-digit or four-digit numbers with zeros in the minuend, uses renaming to find the difference.	89
	3	Given two four-digit numbers, uses renaming to find the difference.	88
WHOLE NUMBERS: MULTIPLICATION	4	Given a two- or three-digit factor multiplied by a two- or three-digit factor, uses renaming to find the product.	84
	5	Given a three- or four-digit factor multiplied by a one-digit factor, uses renaming to find the product.	92
WHOLE NUMBERS: DIVISION	6	Given a three-digit dividend and a one-digit divisor, finds the quotient with or without a remainder.	86
	7	Given a three- or four-digit dividend and a two-digit divisor, finds the quotient with or without a remainder.	71
NUMERATION	8	Given a designated digit in a standard numeral through the hundred thousands place, identifies the place of the designated digit.	83
	9	Given a number with three, four or five digits, rounds to the nearest tens, hundreds or thousands.	79
	10	Given a number through hundred thousands written in words, identifies the equivalent standard numeral.	92
FRACTIONS	11	Given a fraction and a whole number, finds the fractional part of the whole number (e.g., 1/5 of 25 =).	74
	12	Given two fractions less than 1 with like denominators, finds the sum or difference.	79
	13	Given two fractions less than 1 with like or unlike denominators, compares using the words "greater than" or "less than."	55
	14	Given a fraction less than 1, identifies an equivalent fraction.	63
	15	Given a shape with a shaded fractional part (fifths, sixths, sevenths or eighths), identifies the fractional part shaded.	95
DECIMALS	16	Given two decimals through the thousandths place, finds the sum or difference.	92
MEASUREMENT	17	Given a customary measure (e.g., 1 in., 1 lb., 1 qt.) finds an equivalent customary measure; given a linear metric measure, finds the equivalent metric measure.	58
	18	Given a polygon with its dimensions shown, finds the perimeter or area. ("Area" was not tested in 1987)	79

PROBLEM SOLVING	19	Given a story problem requiring the addition, subtraction, multiplication or division of money, finds the sum, difference, product or quotient.	83
	20	Given a story problem requiring addition, subtraction, multiplication or division, estimates the sum, difference, product or quotient.	77
	21	Given a story problem requiring multiplication or division, finds the product or quotient.	78
	22	Given four or five numbers less than 100, finds the average of the numbers. (Was not tested in 1987)	
GRAPHING	23	Given a circle or line graph, uses the graph by making identifications, comparisons and calculations.	95
GEOMETRY	24	Given a pictured cone, cube, cylinder, rectangular prism or sphere, identifies the name of the shape.	87
	25	Given a point, line, angle, or plane figure, identifies the name of the shape or figure.	86

Table A.6
1987 GRADE 8 MATHEMATICS OBJECTIVES

CATEGORY	OBJ#	OBJECTIVE	STATE PERCENT CORRECT
WHOLE NUMBERS	1	Given a two- or three-digit factor multiplied by a two- or three-digit factor, uses renaming to find the product.	96
	2	Given a three- or four-digit dividend and a two-digit divisor, finds the quotient with or without a remainder.	91
FRACTIONS	3	Given two fractions less than 1 with unlike denominators, finds the sum or difference.	74
	4	Given two fractions less than 1 or a fraction less than 1 and a whole number, finds the product or quotient.	76
	5	Given two fractions with unlike denominators and the symbols for greater than, less than and equal to, compares the two fractions and identifies the symbol that describes the relationship between the fractions.	79
	6	Given two mixed numbers with unlike denominators or a mixed number with a whole number or a fraction, finds the sum or difference.	78
	7	Given two mixed numbers with unlike denominators or a mixed number with a whole number or a fraction, finds the product or quotient.	68
	8	Given a fraction greater than 1 or a mixed number, finds the mixed number or whole number for the given fraction or the fraction for the given mixed number.	88
DECIMALS	9	Given two decimals through the thousandths place, finds the sum or difference.	87
	10	Given two decimals, finds the product that does not exceed the ten thousandths place.	82
	11	Given a decimal, selects the number that is the rounded number to the nearest tenth or hundredth for the given decimal.	75
	12	Given a dividend through the ten thousandths place and a divisor through the hundredths place (both decimals have a digit in the ones place), finds the quotient (no rounding).	78
	13	Converts decimals through thousandths to common fractions in lowest terms and common fractions in lowest terms to decimals.	78

MEASUREMENT	14	Given a square, rectangle, triangle or parallelogram with its dimensions shown, finds the area.	59
	15	Given a polygon or circle with its dimensions shown and 3.14 for pi, finds the perimeter or circumference.	82
	16	Given a picture of a ruler scaled by eighths and a line segment, finds the length of the line segment to the nearest eighth of an inch.	77
	17	Given a metric measure, finds the equivalent metric measure.	54
	18	Given a pictured rectangular prism or cube with its dimensions shown, finds the volume.	79
PROBLEM SOLVING	19	Given a story problem with whole numbers requiring more than one operation (including finding the average), finds the answer.	76
	20	Given a story problem with too much information and requiring one step, finds the answer.	77
	21	Given a story problem with fractions or decimals (including standard dollar notation), finds the answer.	70
GRAPHING	22	Given a circle graph with percents, uses the graph by making comparisons and calculations.	71
	23	Given a bar graph or a line graph, uses the graph by making identifications, comparisons and calculations.	81
GEOMETRY	24	Given a pair of lines, identifies the best name of the relationship between the lines (intersecting, parallel or perpendicular).	70
	25	Given an angle, identifies the kind of angle shown (acute, obtuse or right).	76
	26	Given a polygon (square, rectangle, trapezoid, parallelogram and polygons through eight sides), identifies the polygon shown.	80
PRE-ALGEBRA	27	Given an expression involving not more than two variables and a replacement set of non-negative numbers, evaluates the expression. (Was not tested in 1987)	
	28	Given a one-step linear equation not involving negative numbers, finds the value of the unknown.	85
RATIO, PROPORTION AND PERCENT	29	Given a proportion in which one of the ratios has a missing number (e.g. 18/24 = y/20), finds the value of the unknown.	80
	30	Given a problem with the percent known and the number known (e.g., Find 12% of 144), finds the unknown number (part).	68
	31	Converts decimal or common fractions to percentages and percentages to decimal or common fractions.	83
MISCELLANEOUS	32	Estimates sums, differences, products and quotients of whole numbers by rounding the operands to a specified place.	72
	33	Writes decimals through ten thousandths for number word names and word names for decimals through ten thousandths.	76
	34	Given a one-digit number with an exponent, finds the equivalent standard numeral.	77

APPENDIX B
SAMPLE OBJECTIVES RATING SURVEY

TELLS
Testing for Essential Learning and Literacy Skills

OBJECTIVES RATING SURVEY
GRADE 3 READING

The purpose of this survey is to gather opinions about the TELLS grade 3 reading objectives. These objectives were chosen by a group of Pennsylvania educators as those which most students should have mastered by the time of TELLS testing in March. Tests designed to measure these objectives determine which students are in need of remedial help.

This survey is an important one. The results will influence the selection of objectives for future TELLS tests. The ratings will also serve as one basis for determining how many items to allocate to the testing of each objective in future TELLS tests. Your professional assistance in completing the survey will be greatly appreciated.

GENERAL DIRECTIONS

The questionnaire consists of three sections. Section I presents two questions about each of the objectives. In Section II you are asked to evaluate revisions in the present objectives which were suggested by teachers who examined them last Spring in a preliminary version of this survey. In addition, you are asked to suggest revisions which you believe are needed. Section III addresses new objectives. You are asked to evaluate some new objectives suggested by the teachers who responded to our preliminary survey and to write in any which you believe should be added to the list. For all three sections you may feel free to write comments to clarify your opinions.

There is an accompanying answer sheet for your convenience in responding to all sections of the survey. While your responses will be anonymous, we do ask that in the blanks provided on the answer sheet you list your district, your school name and your professional position. When you have completed the survey, return only the answer sheet to the designated person in your school or district. You may retain the remainder of the survey form for your information.

****

SECTION I: RATINGS OF TELLS GRADE 3 READING OBJECTIVES

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Directions:

Find 'Section I' on your answer sheet.

For each objective, circle either 'Yes' or 'No' to the question asking whether the objective is taught to your students by the TELLS testing date in early March. (Of course, each objective should be prefaced by "The student...") If this objective is not taught to most of your students by this time, do not provide a rating of its importance in the next column.

If your answer to the first question is 'Yes' for an objective, provide a rating of the objective's importance using the scale provided in the next column. The ratings should be interpreted as follows:

E Essential	This objective is of the utmost importance for students of this grade level to master. It is necessary and basic to future learning.
I Important	This objective is valuable for students of this grade level to master.
A Adequate	This objective is one which should be included in the list of those for this grade level, but it is not a highly important one.
Q Questionable	This objective should be examined closely before future testings. It may not be one which should be included in the future.
D Delete	This objective should be deleted from the list. It is not one which should form the basis for a TELLS test at this level.

In your rating of each objective, circle one of the five letters which stand for the words above. Try to do this without any concern about how many of each type of rating you give. You may, for example, find all objectives to be **Essential** or many of them to be **Questionable**.

In addition, in the "Comments" column write any comments which you feel will help explain your rating. This will be especially helpful if your rating of a particular objective is a negative one.

CATEGORY	OBJ#	OBJECTIVE
VOCABULARY	1	Selects the meaning of an unfamiliar word from the context of two given sentences or a passage.
	2	Selects the meaning for a multiple-meaning word from the context of a sentence or a passage.
	3	Identifies a word that has the same meaning as an underlined word in the context of a sentence or a passage.
	4	Identifies words that have opposite meanings.

LITERAL COMPREHENSION	5	Identifies a detail or explicit information directly stated in a passage.
	6	Identifies the cause of an explicitly stated cause-effect relationship occurring within a passage.
	7	Identifies the main idea of a passage.
	8	Identifies the sequence of events in a passage.
INFERENTIAL COMPREHENSION	9	Given four words belonging to the same category or a category title, selects the corresponding title or the four words belonging to the category.
	10	Selects the sentence or title that best paraphrases the main idea of a passage.
	11	Selects the implied feelings, motives or traits of the character(s) within a passage.
	12	Determines the most probable outcome of a passage or of an event in a passage.
LIFE/STUDY AND REFERENCE	13	Selects the chapter or page number from a sample table of contents in which specified information can be found.
	14	Identifies the alphabetical order of a list of words (1 to 3 letters deep).

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SECTION II: PROPOSED CHANGES IN THE OBJECTIVES

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Directions, Part 1:

The following changes have been recommended by teachers who previously examined the objectives. In each case the objective in question has been identified by number. The portion of the objective recommended for change has been underlined. Please study each proposed change, then indicate whether you feel it should be made. The responses for this section can be made on the second side of the answer sheet.

If you indicate the change should be made, rate the importance of the revised objective on the same scale as in Section I.

Objective 1	Selects the meaning of an unfamiliar word <u>according to its use in a sentence</u> or a passage.
Objective 2	Selects the meaning of a multiple-meaning word <u>according to its use in</u> a sentence or a passage.
Objective 3	<u>Selects the synonym of a familiar word underlined in</u> a sentence or a passage.
Objective 6	Identifies the cause <u>or the effect</u> of an explicitly stated cause-effect relationship occurring within a passage.
Objective 14	Identifies the alphabetical order of a list of words (1 to <u>2</u> letters deep).

Directions, Part 2:

Write in this area on your answer sheet any changes in the wording of the present objectives you would like to suggest. Make sure you include the number of each objective you are addressing.

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SECTION III: SUGGESTIONS FOR ADDITIONAL OBJECTIVES

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Directions, Part 1:

The following objectives were recommended as additions to the TELLS grade 3 reading list by teachers who previously examined the 1986 list. Please study each in the context of those already in the list, then answer the two questions asked on the answer sheet. Feel free to write comments expressing your opinions in a more detailed way.

Objective 15	Inferential comprehension: Selects the conclusion that can best be inferred from information stated in a passage.
Objective 16	Inferential comprehension: Determines whether a given statement is a fact or an opinion.
Objective 17	Life/study and reference: Selects an answer arrived at by following directions.
Objective 18	Life/study and reference: Given dictionary entries, selects the meaning of a word used in context.
Objective 19	Life/study and reference: Given a picture map with a key, selects information from the map.

Directions, Part 2:

Write in this area on the answer sheet any suggestions you have for objectives which should be added to the grade 3 reading list. Write only objectives which are taught to most of your students by the TELLS testing date and which you would rate either **Essential** or **Important**. Include the category in which the objective would be placed.

Be sure to return your answer sheet to the designated person in your school or district as soon as possible. Thank you for taking the time to participate in this survey. We appreciate your help.

District _____ School _____ Your Position _____

ANSWER SHEET
TELLS OBJECTIVES RATING SURVEY
GRADE 3 READING

SECTION I

Obj#	Is this objective taught to most of your students by the TELLS testing date, i.e., early March?	If it is taught, rate its importance: E = Essential I = Important A = Adequate Q = Questionable D = Delete	Comments
1	Yes No	E I A Q D	
2	Yes No	E I A Q D	
3	Yes No	E I A Q D	
4	Yes No	E I A Q D	
5	Yes No	E I A Q D	
6	Yes No	E I A Q D	
7	Yes No	E I A Q D	
8	Yes No	E I A Q D	
9	Yes No	E I A Q D	
10	Yes No	E I A Q D	
11	Yes No	E I A Q D	
12	Yes No	E I A Q D	
13	Yes No	E I A Q D	
14	Yes No	E I A Q D	

SECTION II

Part 1

Revised Objective	Would you agree that this change should be made?	Using the rating scale defined previously, what would be your rating of this revised objective?	Comments
Objective 1	Yes No	E I A Q D	
Objective 2	Yes No	E I A Q D	
Objective 3	Yes No	E I A Q D	
Objective 6	Yes No	E I A Q D	
Objective 14	Yes No	E I A Q D	

Part 2: Suggested revisions of objectives

SECTION III

Part 1

New Objective	Should this objective be added to the list for grade 3 reading?	Using the rating scale defined previously, what would be your rating of this objective?	Comments
Objective 15	Yes No	E I A Q	
Objective 16	Yes No	E I A Q	
Objective 17	Yes No	E I A Q	
Objective 18	Yes No	E I A Q	
Objective 19	Yes No	E I A Q	

Part 2: Suggested new objectives